

M/045/017

DOGM
MINERALS PROGRAM
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BARRICK

BARRICK RESOURCES (USA), INC.

RECEIVED
JAN 04 1991

DIVISION OF
OIL, GAS & MINING

January 2, 1991

Mr. Don A. Ostler, P.E.
Executive Secretary
Utah Water Pollution Control Committee
P.O. Box 16690
Salt Lake City, Utah 84116-0690

Dear Mr. Ostler:

Subject: Dump Leach Area No. 2, Notice of Violation and Order

Barrick is in receipt of your letter dated December 3, 1990 pertaining to our Dump Leach Area No. 2. This letter was received at the Mercur Mine on Monday, December 10, 1990, via certified mail.

Based on the water quality data enclosed, (which includes a data correction and additional data which the Bureau has not had the opportunity to evaluate), there is no evidence that indicates that the ground water underlying Dump Leach Area No. 2 has been impacted. Our response and supporting documentation to the Notice and Order are provided for your review. As we have concluded, and as we believe the Bureau will also conclude after reviewing the enclosed data, the Bureau's expressed level of concern regarding ground water impacts from Dump Leach Area No. 2 are not warranted.

It is our desire to maintain an open dialogue with the Bureau to resolve the substantive issues in this matter at the earliest possible time. I suggest we arrange a meeting for early January to accomplish this resolution. If the Bureau's concerns cannot be resolved even after review and discussion of the enclosed data, Barrick reserves its rights pursuant to UCA Section 26-11-12 by requiring a hearing before the Water Pollution Control Committee.

Don A. Ostler, P.E.
January 2, 1991
Page 2

Please contact me or Glenn M. Eurick of my staff to discuss any aspect of this matter.

Sincerely,



Frank D. Wicks
Vice President and General Manager

FDW/cg

Attachments

cc: A. R. Hill
D. P. Beatty
D. R. Bird (Parsons, Behle & Latimer)
T. D. Vandell (Dames & Moore)
Grant Bagley (Assistant Attorney General)
Ken Alkema (Director, D.E.H.)
Stephen Matern (Tooele County Health)
Wayne Hedberg (DOGM)
Ken Bousfield (BDW&S)
Glade Shelley (Utah County Health)

BARRICK RESPONSE
NOTICE OF VIOLATION AND ORDER
DOCKET NUMBER GW90-13
DUMP LEACH AREA NO. 2
DECEMBER 3, 1990

Page 1, Statutory Authority

No comment.

Page 1, Findings

Page 1, Item 1 - No comment.

Page 1, Item 2 - No comment.

Pages 1-2, Item 3 - No comment.

Page 2, Item 4 - No comment.

Page 2, Item 5 - The statement "The Construction Permit required that no water from the dump leach enter the ground water or surface water" is not entirely correct. The reference to this aspect of the construction permit can be found on page 3, paragraph 3 of the permit, which is attached for your reference. The language in the permit states "any increase of cyanide, arsenic, or heavy metals in ground water or surface water above background level due to this dump may cause the dump to be listed on the national priority list of hazardous substances sites by EPA pursuant to the Comprehensive Environmental Response Compensation Liability Act (CERCLA).

Page 2, Item 6 - Barrick continues to maintain that for Dump Leach Area No. 2 the earthen liner segment of the composite liner system is the principal control technology.

Page 2, Item 7 - The pregnant liquor solution contained within the dump leaching circuit, including the leakage recovery/collection system, is considered to be in-process solution. It is Barrick's position that unless there is a documented release of the solution, the Bureau does not have regulatory jurisdiction over such in-process solutions. The additional ground water quality data enclosed do not indicate that there has been a release of in-process solution (see following discussion for page 3, Notice of Violation, Items 1-4).

Page 3, Item 8 - The clay (or earthen) liner is considered by Barrick to be the principal control technology or primary liner. The referenced chemical attenuation study was performed to evaluate the cyanide attenuation capabilities of the earthen liner materials. The purpose of the ground water quality monitoring well network was to evaluate if the ground water underlying Dump Leach Area No. 2 had been impacted. This network was designed and installed during November 1989 through January 1990 in close cooperation with the Bureau. A total of 4 boreholes were drilled near Dump Leach Area No. 2 (MW-3, MW-5, MW-7, MW-9), of which MW-3 was abandoned, and the other 3 wells were completed as monitor wells.

Page 3, Item 9 - This is correct. Water wells in Cedar Valley are located about 6 miles to the southeast of Dump Leach Area No. 2.

Page 3, Item 10 - The total cyanide concentration for MW-9 of 0.476 mg/l on March 7, 1990 was unfortunately, incorrectly reported by Chemtech Laboratory (see attached letter from Rex Henderson, Chemtech Laboratory). Although the concentration was questioned at the time, no lab reporting error was discovered at this time. Consequently, Barrick resampled MW-9 one week later on March 15, 1990 to evaluate if the elevated total cyanide measured on March 7, 1990 was correct. The duplicate samples taken on March 15, 1990 were sent to Chemtech, DataChem and Ford laboratories for analysis of total, free and WAD cyanide. As indicated on the attached table, all of the cyanide concentrations in MW-9 were at or near the detection levels, and ranged from <0.01 mg/l to 0.03 mg/l. In addition, during the 8-month period from March 15, 1990 through October 1990, total cyanide was detected at consistently low concentrations, from <0.002 to 0.03 mg/l.

This additional data correction and ground water quality data collected since submittal of the Dames & Moore report (June 1990) to the Bureau should alleviate the Bureau's concern that the ground water underlying Dump Leach Area No. 2 has been impacted. The water quality data obtained from MW-5, MW-7 and MW-9 over the past 8 months indicate compliance with all existing primary drinking water standard MCL's and EPA Health Advisories.

Page 3, Item 1 - The reference to UCA26-11-8(1) is inappropriate for the following reasons:

- The material under leach is not a waste.
- The material under leach was not placed in a location where there is probable cause to believe pollution will result.
- The enclosed data do not indicate that there is or has been a discharge of pollutants from Dump Leach No. 2 into waters of the state.

Page 3, Item 2 - The reference to UCA26-11-8(2)a is not appropriate. The enclosed data do not indicate that pollutants have been discharged into waters of the state.

Page 3, Item 3 - The reference to UACR448-1-2.1 is not appropriate. As noted above, the enclosed data do not indicate that pollutants have been discharged into waters of the state.

Page 3, Item 4 - The reference to UCA26-11-8(2)b and UACR448-1-2.7 are not appropriate for the following reasons:

- Although the FML has failed at Dump Leach Area No. 2, there is no evidence of failed control technology. The earthen liner remains intact and the leakage collection system continues to function as per BWPC-approved design.

- Since the initial detection and collection of solution in the Dump Leach Area No. 2 leakage collection system, the Bureau has been involved with the ongoing monitoring and operation of the facility. Barrick has not operated Dump Leach Area No. 2 without the approval of the Bureau.
- As shown by the enclosed data, there is no evidence of ground water contamination as a result of the operation of Dump Leach Area No. 2. To date, there have been no exceedances of drinking water MCL's and/or EPA Health Advisories.
- Dump Leach Area No. 2 is not a "wastewater treatment works" pursuant to UACR448-1-2.7.

Page 3, Order

Pages 3-4, Item 1 - Although we do not believe it is necessary, we will implement monthly water quality sampling of existing ground water quality monitoring well MW-9 during the remainder of the leaching operations, and will, unless the water quality data indicate a potential problem, continue with quarterly monitoring thereafter. Barrick is currently following the approved Subsurface Water Quality Sampling Quality Assurance and Quality Control Plan for Dump Leach Area No. 3 (as amended and approved) for all Dump Leach Area No. 2 sampling. Monthly Dump Leach Area No. 2 ground water quality monitoring reports will be submitted to the Executive Secretary commencing on or about January 15, 1991, including water level measurements, field data and chain-of-custody sheets, and results of sample analysis, and shall continue until otherwise approved by the Executive Secretary.

Page 4, Item 2 - Although we do not believe it is necessary, we will implement monthly water quality sampling and analysis of the fluid in the leak detection system and results submitted to the Executive Secretary consistent with the applicable provisions of the preceding Item 1.

Page 4, Item 3 - Barrick has previously notified the Bureau that active loading of Dump Leach Area No. 2 ceased in October 1990 and continued active leaching would continue until the completion of resource extraction, anticipated sometime during 1991. It is our intent to initiate closure procedures commensurate with the completion of resource extraction pursuant to the practices and procedures outlined in the Dump Leach Area No. 3 Conceptual Closure Plan dated September 24, 1990. Barrick would request that the Bureau allow 90 days for the submittal of conceptual closure plans and schedules for Dump Leach Area No. 2, while recognizing that a target date for the cessation of active leaching cannot yet be established.

Page 4, Item 4 - The Bureau's order to implement and conduct a comprehensive remediation study is inappropriate at this time. As discussed previously, the enclosed data verify that the one data point on which the Bureau based its NOV was not valid and additional water quality data indicate that the ground water quality at Dump Leach Area No. 2 has not been impacted. Barrick does not believe it is necessary to initiate a remediation study until: (1) evidence is found which would scientifically justify such an action, and (2) discussions have been held with the Bureau regarding the Bureau's November 26, 1990 review letter of the June 12, 1990 Hydrogeologic Report on Dump Leach Area No. 2 and Tailings Pond.

Page 5, Paragraph 1 - It is Barrick's intent to appeal this Notice of Violation and Order to the Water Pollution Control Committee.

In the cover letter to this response, Barrick indicates its desire to meet with the Water Pollution Control Committee (WPCC) staff concerning these issues, but reserves its rights by requiring a hearing before the WPCC should the issue not be resolved informally.



STATE OF UTAH
DEPARTMENT OF HEALTH

SEP 23 1985

NORMAN H. BANGERTER, GOVERNOR

SUZANNE DANDOOY, M.D., M.P.H., EXECUTIVE DIRECTOR

September 19, 1985
533-6146

Mr. John Sprague
General Manager
Barrick Mercur Gold Mines Inc.
P.O. Box 838
Tooele, Utah 84074-0838

RE: Barrick Mercur Gold Mine
Heap Leach Operation
Heap No. 2
Construction Permit

Dear Mr. Sprague:

We have reviewed the plans and specifications for heap no. 2 of your leaching operations and find that they comply with the Code of Waste Disposal Regulations and therefore, a construction permit as constituted by this letter is hereby issued subject to the following conditions:

1. Notification must be given to this Bureau prior to commencing the laying of the 18 inch clay aggregate leak detection liner so appropriate inspections can be arranged.
2. Written notification must be submitted to this Bureau when the leaching operations have been completed and the dump has been pumped essentially dry.
3. If a leak is detected all leaching operations must cease and the Bureau must be notified verbally within 24 hours and in writing within 7 days of the detection of the leak. A contingency plan describing in detail what actions will be taken to mitigate the impacts of the leakage has been received and is being reviewed. We understand from that plan dated 21 August 1985 that it will apply to all heap leach operations conducted by Barrick Mercur mines.
4. Once the leaching operations have been completed the following procedure must be followed to insure that no water from the dump enters the ground water or surface water:
 - A. The dump will be neutralized by spraying until the cyanide concentration in the water pumped from the dump is less than 5 parts per million.
 - B. A cap will be placed on the dump consisting of 1 foot of clay aggregate material, covered by 3 feet of subsoil, covered by 1 foot of top soil. The cap when completed shall be sloped so water will run off the cap and be directed into the surface runoff diversion ditches.

KENNETH L. ALKEMA, DIRECTOR • DIVISION OF ENVIRONMENTAL HEALTH

- C. The heap will be pumped until the free drainable liquid in the dump has been removed.
5. During construction of the clay aggregate liner field tests shall be conducted according to the following requirements which are based on a minimum of 2 lifts. We require that a maximum of 100 foot grid per lift be used to test the Atterburg limits and gradation and a maximum of 50 foot grid per lift be used to test compaction. A random sample location within each grid square shall be chosen for the test. This method should yield approximately 100 tests for Atterburg limits and gradation and 400 tests for compaction. In addition we will require at least 24 permeability tests randomly located in a 200 foot by 100 foot rectangle grid system per lift. The results of these tests must be submitted to the Bureau for review.
 6. Gradation tests shall be conducted on the clay aggregate material at a minimum rate of 1 test per day or 1 test per 500 tons per day while it is being placed and the results submitted to the Bureau.
 7. A field seam, as outlined in the specifications, or equivalent must be provided for the overlap of the geomembrane at the midslope anchorage ditch.
 8. The processed clay aggregate material containing 3 inch maximum size will be placed in all lifts of the clay aggregate liner as a result of the gradation results submitted by Barrick which show more than 50% of this material being finer than 200 mesh. This material in place shall have a coefficient of permeability no greater than 10^{-7} cm per second.
 9. The clay aggregate material used to construct the 18 inch leak detection liner should have at least 35% by weight passing the no. 200 sieve.
 10. Per phone conversation with Mr. John Sprague of Barrick Mining on August 6, 1985 one foot of large granular sand containing no more than 20 per cent sag mill reject rock one inch maximum size shall be placed between the top geotextile material and the ore to be leached on the flatter bottom areas but not on the steeper side slopes.

The heap leach dump approved by this permit is approximately 1200 feet long, 700 feet wide and a maximum of 90 feet high. The dump shall be entirely underlain by the following liner/leak detection systems which will direct all leakage to a leak detection sump.

- (a) Under the lower level where the ore will be approximately 90 feet thick or greater there will be from the top down:
 - (1) 127 Mil geotextile equivalent to 1155 fabric.
 - (2) 40 mil geomembrane HDPE
 - (3) Drainage net equivalent to XB8300 NSB.
 - (4) 127 mil geotextile equivalent to 1155 fabric.
 - (5) 18 inches of compacted clay aggregate.

Mr. John Sprague
Page three

(b) Under the upper level where the ore will be approximately 90 feet thick or less there will be from the top down.

- (1) 127 mil geotextile equivalent to 1155 Fabric.
- (2) 40 mil geomembrane HDPE.
- (3) 127 mil geotextile equivalent to 1155 Fabric.
- (4) 18 inches of compacted clay aggregate.

The leak detection sump will be monitored on a regular daily basis by the crew assigned to operate the dump.

It should be understood that this permit applies only to the leach dump described herein. Any additions to this dump or additional heap leach dumps will require a separate construction permit.

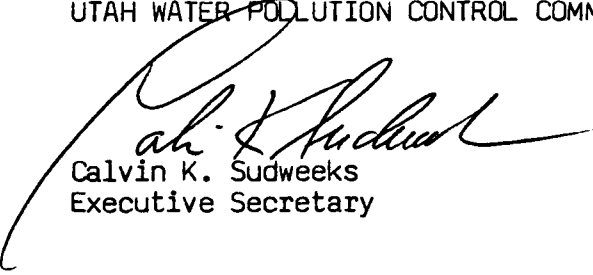
We are advising you that, according to Federal Law, any increase of cyanide, arsenic, or heavy metals in ground water or surface water above background level due to this dump may cause the dump to be listed on the national priority list of hazardous substances sites by EPA pursuant to the Comprehensive Environmental Response Compensation Liability Act (CERCLA).

All wastes not exempt under the mining exemption will need to be managed in accordance with Utah's Hazardous Waste Management Regulations (i.e. spent solvents, off specification cyanide, and chemicals etc.).

Please call Mr. Charlie Dietz of our staff if there are any questions.

Sincerely,

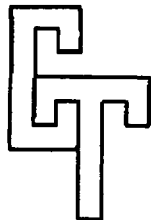
UTAH WATER POLLUTION CONTROL COMMITTEE



Calvin K. Sudweeks
Executive Secretary

OGD/LBM:dm

cc: Glenn Eurick, Barrick Mining
Tooele County Health Department
Loren Morton
Tom Suchoski, Oil, Gas, and Mining
3252



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

December 20, 1990

Terry Vandell
Dames & Moore, Inc.
250 East 300 South
Salt Lake City, UT 84111

Dear Terry:

Attached is a copy of the Lab Bench Sheet for Cyanide for sample # U048720 of 3-7-90. A calculation error occurred and therefore the total Cyanide value was actually 0.0091 and not 0.476 as reported. I apologize for any problems that this has caused.

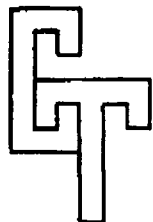
The low levels of Cyanide detected could be attributed to Matrix interference from such things as Nitrates and Nitrites or Organics naturally in the water. These have the potential to give false positives for Cyanides, as they can convert to Cyanide during the Laboratory Distillation process due to the acid and heat combination. The low levels we are seeing are well below Drinking Water Standards and should not be viewed as serious.

If you have any further questions please call me at 262-7299.

Sincerely,

Rex Henderson
Director

RH:slb



CHEMTECH

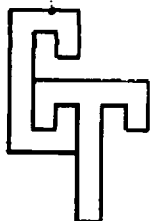
CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299TO: Dames & Moore
127 S. 500 E. #300
Salt Lake City, Utah 84102SAMPLE ID: Lab #U048720 - Barrick MW-9, Submitted 3-8-90
Collected 3-7-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Alkalinity as CaCO_3 , mg/l	286
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as $\text{NH}_3\text{-N}$, mg/l	0.65
Arsenic as As (T), mg/l	0.019
Arsenic as As (D), mg/l	0.015
Barium as Ba (T), mg/l	0.11
Barium as Ba (D), mg/l	0.080
Bicarbonate as HCO_3 , mg/l	348
Boron as B (T), mg/l	0.24
Cadmium as Cd (T), mg/l	<.01
Cadmium as Cd (D), mg/l	<.01
Calcium as Ca, mg/l	88.4
Carbonate as CO_3 , mg/l	0
Chloride as Cl, mg/l	105
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhms/cm	1,070
Copper as Cu (T), mg/l	0.032
Copper as Cu (D), mg/l	0.027

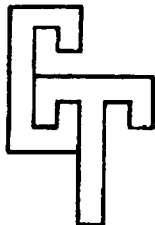
Rex Henderson

**CHEMTECH**

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299TO: Dames & Moore
127 S. 500 E. #300
Salt Lake City, Utah 84102SAMPLE ID: Lab #U048720 - Barrick MW-9, Submitted 3-8-90
Collected 3-7-90CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Cyanide as CN (T), mg/l	0.0091
WAD Cyanide as CN, mg/l	<.01
Cyanide as CN (Free), mg/l	<.01
Fluoride as F, mg/l	0.67
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as CaCO ₃ , mg/l	497
Hardness (Non-Carb) as CaCO ₃ , mg/l	109
Hardness (T) as CaCO ₃ , mg/l	547
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	1.71
Iron as Fe (D), mg/l	0.317
Lead as Pb (T), mg/l	0.015
Lead as Pb (D), mg/l	<.01
Magnesium as Mg (T), mg/l	79.9
Magnesium as Mg (D), mg/l	79.1
Manganese as Mn (T), mg/l	0.065
Manganese as Mn (D), mg/l	0.057
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	0.045
Nickel as Ni (D), mg/l	0.045



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299TO: Dames & Moore
250 East 300 South
Salt Lake City, UT 84111SAMPLE ID: Lab #U048720 - Barrick MW-9, Sub. 3-8-90
Collected 3-7-90 @ 1755

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Nitrate as $\text{NO}_3\text{-N}$, mg/l	0.082
Nitrite as $\text{NO}_2\text{-N}$, mg/l	<.005
Phosphate as $\text{PO}_4\text{-P}$ (T), mg/l	<.01
Potassium as K, mg/l	1.4
Selenium as Se (T), mg/l	0.0024
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	19.1
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	30.5
Sulfate as SO_4 , mg/l	183
Suspended Solids, mg/l	4.0
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	505
Turbidity, NTU	6.0
Zinc as Zn (T), mg/l	0.065
Zinc as Zn (D), mg/l	0.060
pH Units	7.44
Cations, meq/l	12.34
Anions, meq/l	12.51


Rex Henderson

CYANIDE - COLORMETRIC METHOD

ASTM D 2036 -87

ANALYST PGDATE OF ANALYSIS 3/8/90TIME: 11:45

SAMPLE IDENTIFICATION	VOL. REFLUX A	FINAL VOL. NaOH B	ml USED FOR COLOR DEVELP. C	FINAL VOL.	ABS. e 578	CORR. ABS.	ug CN	CN mg/l
Blank					0.000			
1 ug			10 ml		0.008			
5 ug			50 ml		0.364			
10 ug			100 ml		0.600			
20 ug			200 ml		0.108			
48733-T	50	100ml	10	100ml	0.317			1.08 TOTAL
48734-T	100		25		0.297			0.202
48735-T	100		10		0.420			0.727
48736-T	5		1		0.178			58.02
48737-T	5		5		0.346			23.74
48733-A	100		50		0.677	0.022	1.09	1.058
48734-A	400		50		0.134	0.011	0.202	0.191
48735-A	300		50		0.126	0.013	0.727	0.714
48736-A	5		50		0.544	3.80	58.02	54.22
48737-A	5		50		0.306	20.85	23.74	2.89
Blank					0.001			-0.295
5 ug					0.303			5.159
48741-T	250		250		0.452			0.314
48741-A	250		50		0.055	0.005	0.314	0.309

CALCULATION : CN mg/l = $\frac{\text{ug CN from curve}}{A * \frac{C}{B}}$

WHERE: A = Volume Refluxed
B = Final Volume of NaOH
Absorber (nor. = 100 ml)
C = ml Used for Color
Development

cyanide

Analyst: P.I
Date: 03-08-90

Blank: 0.000
Std 1: 0.068
Std 5: 0.304
Std 10: 0.600
Std 20: 1.108

Corr: 1.0
Int: 0.0174

Sample Id	Absorbance	u9
48733	0.317	5.412
48734	0.297	5.051
48735	0.420	7.272
48736	0.178	2.901
48737	0.346	5.936
48733	0.077	1.077
48734	0.134	2.107
48735	0.126	1.962
48736	0.544	9.512
48737	0.306	5.213
BLK	0.001	-0.295
SUG	0.303	5.159
48741	0.452	7.850
48741	0.055	0.680
48720	0.093	1.366
48720	0.031	2.053
48734+5	0.428	7.417
48734+5	0.414	7.164
BLK	0.001	-0.295
SUG	0.302	5.141

WATER QUALITY (MCL'S)

3.0 GENERAL

Maximum contaminant levels (MCL'S) are herein established for those routinely measurable substances which may be found in water supplies.

"Primary" standards are established for the protection of human health. "Secondary" regulations are established to provide guidance in evaluating the esthetic qualities of drinking water.

The applicable "Primary" standards must be met by all public drinking water systems. The "Secondary" standards are recommended levels which should be met in order to avoid consumer complaint.

The methods used to determine compliance with these maximum contaminant levels are given in Section 4. Analytical techniques which must be followed in making the required determinations shall be as given in 40 CFR, Sections 141.21a, 141.22f, 141.24e, f and 41 CFR, Section 141.25.

There are other contaminants such as viruses, protozoans, and other chemical and biological substances known to cause disease for which no MCL's have been established, and routine tests are not available to determine their presence. Because of the health hazard posed by the presence of these substances, surface water sources and groundwater contaminated by surface sources must be given complete treatment as described in Section 8.

3.1 PRIMARY DRINKING WATER STANDARDS3.1.1 INORGANIC CHEMICALS

- a. The following are the maximum contaminant levels for inorganic chemicals other than fluoride. These contaminant levels apply to community water systems.

<u>Contaminant</u>	<u>Level</u> <u>mg/l</u>
Arsenic	0.05
Barium	1.
Cadmium	0.010
Chromium	0.05
Lead	0.05
Mercury	0.002
Nitrate (as N)	10.
Selenium	0.01
Silver	0.05
Sodium	---- (see Note 1 below)
Sulfate	1000 (see Note 2 below)
Total Dissolved Solids . . .	2000 (see Note 3 below)

NOTE:

1. No maximum contaminant level has been established for sodium. However, this contaminant must be monitored and reported in accordance with the requirements of Sections 4.3.1.1.
2. If the sulfate level of a community water system is greater than 500 mg/l, the supplier must satisfactorily demonstrate that:
 - a. No better quality water is available, and
 - b. The water shall not be available for human consumption from commercial establishments. In no case shall the committee allow the use of water having a sulfate level greater than 1000 mg/liter.
3. If TDS is greater than 1000 mg/l, the supplier shall satisfactorily demonstrate to the Committee that no better water is available. The Committee shall not allow the use of an inferior source of water if a better source of water (i.e. lower in TDS) is available.
- b. When the annual average of the maximum daily air temperatures for the location in which the community water system is situated is the following, the maximum contaminant level for fluoride in community water system shall be:

<u>Temperature</u> <u>Degree Fahrenheit</u>	<u>Temperature</u> <u>Degree Celsius</u>	<u>Level</u> <u>mg/l</u>
58.4 to 63.8	14.5 to 17.6	2.0
63.9 to 70.6	17.7 to 21.4	1.8
70.7 to 79.2	21.5 to 20.2	1.6

- c. Water serving non-community systems should meet all the requirements of the above Items a and b. As a minimum, however, the MCL for nitrate and sulfate must not be exceeded in any non-community water supply.

However, in the case of non-community water supply systems which exceed the MCL for nitrate, the Executive Secretary may allow, on a case-by-case basis, a nitrate level not to exceed 20 mg/l if the supplier can adequately demonstrate:

1. such water will not be available to children under 6 months of age; this may be the case in prisons, nursing homes and industrial facilities, and
2. there will be continuous posting of the fact that nitrate levels exceed 10 mg/l and the potential health effect of exposure, and
3. the water is analyzed in conformance to Section 4.3.1.1c, and
4. that no adverse health effects will result.

3.1.2 ORGANIC CHEMICALS

The following are the maximum contaminant levels for organic chemicals. They apply only to community water systems.

	Level <u>mg/l</u>
a. Chlorinated hydrocarbons:	
<u>Endrin</u> 1,2,3,4,10, 10-hexachloro-6, 7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo, endo-5, 8-dimethano naphthalene).	<u>0.0002</u>
<u>Lindane</u> 1,2,3,4,5,6-hexachloro-cyclohexane, gamma isomer).	<u>0.004</u>
<u>Methoxychlor</u> (1,1,1-Trichloro-2,2 bis (p-methoxyphenyl)ethane).	<u>0.1</u>
<u>Toxaphene</u> (C ₁₀ H ₁₀ Cl ₈ -Technical chlorinated camphene, 67-69 percent chlorine).	<u>0.005</u>
b. Chlorphenoxys:	
<u>2,4-D</u> , (2,4-Dichlorophenoxyacetic acid).	<u>0.1</u>
<u>2,4,5-TP Silvex</u> (2,4,5-Trichlorophenoxypropionic acid).	<u>0.01</u>

3.1.3 TURBIDITY

The maximum contaminant levels for turbidity are applicable to both community water systems and non-community water systems.

The maximum contaminant levels for turbidity in drinking water, except for drinking water from ground water sources not contaminated by surface sources are:

- a. One turbidity unit (TU) as determined by a monthly average pursuant to Section 4.3.3.1 except that five or fewer turbidity units may be allowed if the supplier of water can demonstrate to the Committee that the higher turbidity does not do any of the following:
 1. interfere with disinfection,
 2. prevent maintenance of an effective disinfectant agent throughout the distribution system, or
 3. interfere with microbiological determinations.

- b. Five turbidity units based on an average for two consecutive days pursuant to Section 4.3.3.2c.

The maximum contaminant level for turbidity in drinking water from groundwater sources not contaminated by surface sources is 5.0. TU.

3.1.4 MICROBIOLOGICAL QUALITY

The maximum contaminant level for coliform bacteria, applicable to community water systems and non-community water systems, are as follows:

- a. When the membrane filter technique is used, the number of coliform bacteria shall not exceed any of the following:
 - 1. One per 100 milliliters as the arithmetic mean of all samples examined per month pursuant Section 4.3.4.1.
 - 2. Four per 100 milliliters in more than one sample when less than 20 are examined per month; or
 - 3. Four per 100 milliliters in more than five percent of the samples when 20 or more are examined per month.
- b. When five tube fermentation method and ten milliliter standard portions are used, coliform bacteria shall not be present in any of the following:
 - 1. more than ten percent of the portions examined in any month pursuant to Section 4.3.4.1
 - 2. three or more portions in more than one sample when less than 20 samples are examined per month; or
 - 3. three or more portions in more than five percent of the samples when 20 or more samples are examined per month.
- c. For community or non-community systems that are required to sample at a rate of less than four per month, compliance with paragraphs (a) or (b) of this section shall be based upon sampling during a three month period.

3.1.5 RADIONUCLIDES

- a. Radium-226, Radium-228. and gross alpha particle radioactivity in community water systems:

The following are the maximum contaminant levels for Radium-226, and Radium-228, and gross alpha particle radioactivity:

1. Combined Radium-226 and Radium-228 5 pCi/l.
 2. Gross alpha particle activity (including Radium-226 but excluding Radon and Uranium) 15 pCi/l.
- b. Beta particle and photon radioactivity from man-made radionuclides in community water systems:
1. The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than four millirem/year.
 2. Except for the radionuclides listed in Table 3-1, the concentration of man-made radionuclides causing four mrem total body or organ dose equivalents shall be calculated on the basis of a two liter per day drinking water intake using the 168 hour data listed in "Maximum Permissible Body Burden and Maximum Permissible Concentration of Radionuclides in Air or Water or Occupational Exposure", NBS Handbook 69 as amended August 1963, U.S. Department of Commerce. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed four millirem/year.

Table 3-1 Average annual concentrations assumed to produce a total body or organ dose of four mrem/year.

<u>Radionuclide</u>	<u>Critical Organ</u>	<u>pCi per liter</u>
Tritium	Total Body	20,000
Strontium-90	Bone Marrow	8

3.1.6 TOTAL TRIHALOMETHANES (TTHM)

The maximum contaminant level for total trihalomethane (TTHM) compounds for community water systems serving a population of 10,000 or above shall be either of the following:

- a. The running average of analyses results of quenched TTHM samples for four consecutive calendar quarters shall not exceed 100 micrograms per liter.

- b. The single sample Total Trihalomethane Formation Potential (THMFP) shall not exceed 100 micrograms per liter. Approval is needed from the Executive Secretary to substitute this test for part a. above, and may only be used for groundwater sources.

3.2 SECONDARY DRINKING WATER STANDARDS

The Secondary Maximum Contaminant Levels for public water systems deal with substances which affect the esthetic quality of drinking water. They are presented here as recommended limits or ranges and are not grounds for rejection. The taste of water may be unpleasant and the usefulness of the water may be impaired if these standards are significantly exceeded.

<u>Contaminant</u>	<u>Level</u>
Chloride	250 mg/l
Color	15 Color Units
Copper	1 mg/l
Corrosivity	Non-corrosive
Foaming Agents	0.5 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l
Odor	3 Threshold Odor Number
pH	6.5-8.5
Sulfate	250 mg/l*
TDS	500 mg/l*
Zinc	5 mg/l

- * Maximum allowable TDS and Sulfate levels are given in the Primary Drinking Water Standards, Section 3.1.1. They are listed as secondary standards because levels in excess of these recommended levels will likely cause consumer complaint.

3.3 UNMONITORED CONTAMINANTS

No MCLs are established herein for unmonitored contaminants; viruses, protozoans and other chemical and biological substances. Tests to determine their presence are too expensive and as yet unreliable for routine monitoring. Because of this, the Committee has determined that the minimum level of treatment as described in Section 8 herein or its equivalent is required for surface water sources and ground water contaminated by surface sources which are vulnerable to contamination by those substances. (See Section 4.3.6).

WATER QUALITY ANALYSIS LOG

STATE: UTAH
COUNTY: TOOELE
LOCATION: South-East Side Dump Leach #2
SOURCE TYPE: DEEP WELL
SOURCE USE: MONITOR

mg/l(unless noted)

* SOURCE NUMBER: MW - 5

SAMPLE METHOD: PUMP / GRAB
SAMPLER: D. P. Beatty, H. O. Herrera

FLOW (gpm):	4	5									
DEPTH B.G.L.(ft.):	35	35.53									
LABORATORY	CHEMTECH	CHEMTECH	CHEMTECH								
LABORATORY NUMBER	U049927	U052856	U056131								
SAMPLE DATE	4/20/90	7/26/90	10/22/90								
ANIONS MEQ/l	13.58	10.55	12.74								
CATIONS MEQ/l	14.74	10.64	12.73								
TOTAL IONS MEQ/l	28.32	21.19	25.47	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
ION DIFFERENTIAL %	7.87	0.85	0.08	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
ALKALINITY, CaCO3	236	331	340								
ALUMINUM, Al (ttl)	< 0.1	< 0.1	< 0.1								
ALUMINUM, Al (diss)	---	< 0.1	< 0.1								
AMMONIA, NH3	0.54	< 0.1	< 0.1								
ARSENIC, As (ttl)	< 0.01	< 0.01	< 0.01								
ARSENIC, As (diss)	---	< 0.01	< 0.01								
BARIUM, Ba (ttl)	< 0.01	< 0.01	0.025								
BARIUM, Ba (diss)	---	< 0.01	0.025								
BICARBONATE, HCO3	287	401	407								
BORON, B (ttl)	33	0.214	0.19								
CADMIUM, Cd (ttl)	< 0.01	< 0.002	< 0.002								
CADMIUM, Cd (diss)	---	< 0.002	< 0.002								
CALCIUM, Ca	98.7	71	112								
CARBONATE, CO3	0	1.2	3.6								
CHLORIDE, Cl	195	93.1	138								
CHROMIUM, Cr (hex)	< 0.01	< 0.01	< 0.01								
CHROMIUM, Cr (ttl)	< 0.01	< 0.01	< 0.01								
CHROMIUM, Cr (diss)	---	< 0.01	< 0.01								
CONDUCTIVITY, FIELD umho	---	1160	1039								
CONDUCTIVITY, LAB (umho)	1600	919	989								
COPPER, Cu (ttl)	< 0.01	< 0.01	0.038								
COPPER, Cu (diss)	---	< 0.01	0.022								
CYANIDE, CN (ttl)	< 0.002	0.0041	0.0054								
CYANIDE, CN (free)	< 0.002	< 0.002	0.0023								

mq/1(unless noted)

SOURCE NUMBER: MW - 5

SAMPLE METHOD: PUMP / GRAB
SAMPLER: D. P. Beatty, H. O. Herrera

PAGE 2 OF 3

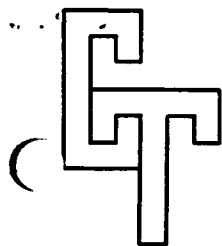
ENVIRONMENTAL / HEALTH

mg/l(unless noted)

SOURCE NUMBER: MW - 5

SAMPLE METHOD: PUMP / GRAB
SAMPLER: D. P. Beatty, H. O. Herrera

FLOW (gpm):	4	5							
DEPTH B.G.L.(ft.):	35	35.53							
LABORATORY	CHEMTECH	CHEMTECH	CHEMTECH						
LABORATORY NUMBER	U049927	U052856	U056131						
SAMPLE DATE	4/20/90	7/26/90	10/22/90						
SILVER, Ag (diss)	---	< 0.01	< 0.01						
SODIUM, Na	130	106	109						
SULFATE, SO4	161	61	97						
SUSPENDED SOLIDS	7.5	4	---						
TEMPERATURE, FIELD (C)	---	---	10.7						
THALLIUM, Tl (ttl)	< 0.01	< 0.01	< 0.01						
THALLIUM, Tl (diss)	---	< 0.01	< 0.01						
TOTAL DISS. SOLIDS, FIELD	---	---	683						
TOTAL DISS. SOLIDS, LAB	1180	544	681						
TURBIDITY, FIELD (ntu)	---	4.6	3						
TURBIDITY, LAB (ntu)	0.38	1	1.5						
ZINC, Zn (ttl)	0.025	0.013	< 0.01						
ZINC, Zn (diss)	---	< 0.01	< 0.01						
pH, FIELD (pH units)	---	6.9	7						
pH, LAB (pH units)	7.49	8.21	8.28						



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 11-23-90

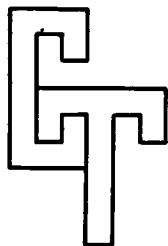
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U056131 - MW-5, Collected 10-22-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Alkalinity as CaCO_3 , mg/l	340
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as $\text{NH}_3\text{-N}$, mg/l	<.1
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.025
Barium as Ba (D), mg/l	0.025
Bicarbonate as HCO_3 , mg/l	407
Boron as B (T), mg/l	0.19
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	112
Carbonate as CO_3 , mg/l	3.6
Chloride as Cl, mg/l	138
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	989
Copper as Cu (T), mg/l	0.038
Copper as Cu (D), mg/l	0.022

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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 11-23-90

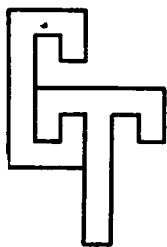
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U056131 - MW-5, Collected 10-22-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Cyanide as CN (T), mg/l	0.0054
WAD Cyanide as CN, mg/l	0.0023
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.36
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as CaCO ₃ , mg/l	351
Hardness (Non-Carb) as CaCO ₃ , mg/l	0
Hardness (T) as CaCO ₃ , mg/l	398
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	0.128
Iron as Fe (D), mg/l	0.068
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	29.9
Magnesium as Mg (D), mg/l	28.8
Manganese as Mn (T), mg/l	0.022
Manganese as Mn (D), mg/l	<.010
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01


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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 11-23-90

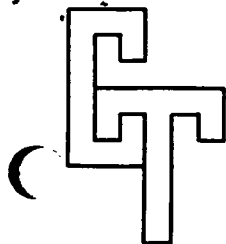
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U056131 - MW-5, Collected 10-22-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Nitrate as $\text{NO}_3\text{-N}$, mg/l	1.39
Nitrite as $\text{NO}_2\text{-N}$, mg/l	0.084
Phosphate as $\text{PO}_4\text{-P}$ (T), mg/l	<.01
Potassium as K, mg/l	0.3
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	3.8
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	109
Sulfate as SO_4 , mg/l	97
Suspended Solids, mg/l	681
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	681
Turbidity, NTU	1.5
Zinc as Zn (T), mg/l	<.01
Zinc as Zn (D), mg/l	<.01
pH Units	8.28
Cations, meq/l	12.73
Anions, meq/l	12.74


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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 9-26-90

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

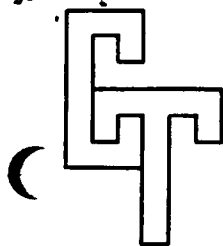
SAMPLE ID: Lab #U052856 - MW-5, 7-26-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Alkalinity as CaCO_3 , mg/l	331
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as $\text{NH}_3\text{-N}$, mg/l	<.1
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	<.01
Barium as Ba (D), mg/l	<.01
Bicarbonate as HCO_3 , mg/l	401
Boron as B (T), mg/l	0.214
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	71
Carbonate as CO_3 , mg/l	1.2
Chloride as Cl, mg/l	93.1
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	919
Copper as Cu (T), mg/l	<.01
Copper as Cu (D), mg/l	<.01

FIELD DATA	
Sample I.D.:	Date:
Temperature (°F):	
pH (units):	
Specific Conductance (umho):	
Turbidity (NTU):	


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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 9-26-90

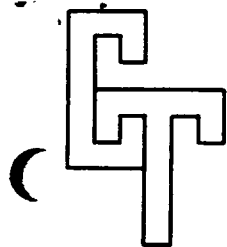
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U052856 - MW-5, 7-26-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Cyanide as CN (T), mg/l	0.0041
WAD Cyanide as CN, mg/l	<.002
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.24
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as CaCO ₃ , mg/l	321
Hardness (Non-Carb) as CaCO ₃ , mg/l	0
Hardness (T) as CaCO ₃ , mg/l	330
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	0.275
Iron as Fe (D), mg/l	0.130
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	30.2
Magnesium as Mg (D), mg/l	30.1
Manganese as Mn (T), mg/l	0.030
Manganese as Mn (D), mg/l	0.030
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01


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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 9-26-90

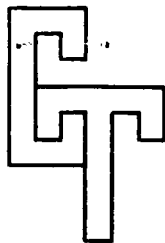
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U052856 - MW-5, 7-26-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Nitrate as NO ₃ -N, mg/l	1.92
Nitrite as NO ₂ -N, mg/l	0.03
Phosphate as PO ₄ -P (T), mg/l	<.01
Potassium as K, mg/l	0.4
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO ₂ (D), mg/l	3.3
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	106
Sulfate as SO ₄ , mg/l	61
Suspended Solids, mg/l	4.0
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	544
Turbidity, NTU	1.0
Zinc as Zn (T), mg/l	0.013
Zinc as Zn (D), mg/l	<.01
pH Units	8.21
Cations, meq/l	10.64
Anions, meq/l	10.55


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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 5-15-90

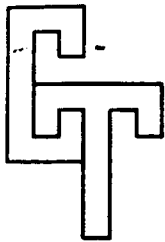
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U049927 - MW-5, 4-20-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Alkalinity as CaCO_3 , mg/l	236
Aluminum as Al (T), mg/l	<.1
Ammonia as $\text{NH}_3\text{-N}$, mg/l	0.54
Arsenic as As (T), mg/l	<.01
Barium as Ba (T), mg/l	<.01
Bicarbonate as HCO_3 , mg/l	287
Boron as B (T), mg/l	0.33
Cadmium as Cd (T), mg/l	<.01
Calcium as Ca, mg/l	98.7
Carbonate as CO_3 , mg/l	0
Chloride as Cl, mg/l	195
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Conductivity, uhmos/cm	1,600
Copper as Cu (T), mg/l	<.01
Cyanide as CN (T), mg/l	<.002
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.32
Gold as Au, mg/l	<.01
Hardness as CaCO_3 , mg/l	470
Hardness (Non-Carb) as CaCO_3 , mg/l	383
Hardness (T) as CaCO_3 , mg/l	446
Hydroxide as OH, mg/l	0

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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 5-15-90

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U049927 - MW-5, 4-20-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Iron as Fe (Diss), mg/l	0.30
Iron as Fe (T), mg/l	0.338
Lead as Pb (T), mg/l	<.01
Magnesium as Mg, mg/l	48.4
Manganese as Mn (T), mg/l	0.210
Mercury as Hg, mg/l	<.0002
Nickel as Ni (T), mg/l	0.015
Nitrate as NO ₃ -N, mg/l	0.070
Nitrite as NO ₂ -N, mg/l	<.005
Phosphate as PO ₄ -P (Ortho), mg/l	<.01
Potassium as K, mg/l	4.9
Selenium as Se (T), mg/l	<.002
Silica as SiO ₂ (Diss), mg/l	6.2
Silver as Ag (T), mg/l	<.01
Sodium as Na, mg/l	130
Sulfate as SO ₄ , mg/l	161
Suspended Solids, mg/l	7.5
Thallium as Tl, mg/l	<.01
Total Dissolved Solids, mg/l	1,180
Turbidity, NTU	0.38
Zinc as Zn (T), mg/l	0.025
pH Units	7.49
WAD Cyanide as CN, mg/l	<.002
Cations, meq/l	14.74
Anions, meq/l	13.58


Rex Henderson

WATER QUALITY ANALYSIS LOG

STATE: UTAH
COUNTY: TOOELE
LOCATION: South-East Side Dump Leach #2
SOURCE TYPE: DEEP WELL
SOURCE USE: MONITOR

mg/l(unless noted)

* SOURCE NUMBER: MW - 7

SAMPLE METHOD: PUMP / GRAB
SAMPLER: D. P. Beatty, H. O. Herrera

FLOW (gpm):	6	6	5.5							
DEPTH B.G.L.(ft.):	26	26.15	26.25							
LABORATORY	CHEMTECH	CHEMTECH	CHEMTECH							
LABORATORY NUMBER	U049928	U052857	U056132							
SAMPLE DATE	4/20/90	7/26/90	10/22/90							
ANIONS MEQ/l	9.76	18.3	21.96							
CATIONS MEQ/l	10.79	19.6	21.89							
TOTAL IONS MEQ/l	20.55	37.9	43.85	ERR	ERR	ERR	ERR	ERR	ERR	ERR
ION DIFFERENTIAL %	9.55	6.63	0.32	ERR	ERR	ERR	ERR	ERR	ERR	ERR
ALKALINITY, CaCO3	226	415	420							
ALUMINUM, Al (ttl)	< 0.1	< 0.1	< 0.1							
ALUMINUM, Al (diss)	---	< 0.1	< 0.1							
AMMONIA, NH3	0.76	< 0.1	< 0.1							
ARSENIC, As (ttl)	< 0.01	< 0.01	< 0.01							
ARSENIC, As (diss)	---	< 0.01	< 0.01							
BARIUM, Ba (ttl)	< 0.01	< 0.01	< 0.01							
BARIUM, Ba (diss)	---	< 0.01	< 0.01							
BICARBONATE, HCO3	276	506	361							
BORON, B (ttl)	0.24	0.254	0.23							
CADMIUM, Cd (ttl)	< 0.01	< 0.002	< 0.002							
CADMIUM, Cd (diss)	---	< 0.002	< 0.002							
CALCIUM, Ca	82.4	194	224							
CARBONATE, CO3	0	0	74.6							
CHLORIDE, Cl	73.4	146	229							
CHROMIUM, Cr (hex)	< 0.01	< 0.01	< 0.01							
CHROMIUM, Cr (ttl)	< 0.01	< 0.01	< 0.01							
CHROMIUM, Cr (diss)	---	< 0.01	< 0.01							
CONDUCTIVITY, FIELD umho	---	1800	1882							
CONDUCTIVITY, LAB (umho)	812	1766	1580							
COPPER, Cu (ttl)	< 0.01	< 0.01	0.017							
COPPER, Cu (diss)	---	< 0.01	0.012							
CYANIDE, CN (ttl)	0.0027	0.0073	0.0065							
CYANIDE, CN (free)	< 0.002	< 0.002	< 0.002							

ENVIRONMENTAL / HEALTH

mg/l (unless noted)

SOURCE NUMBER: MW - 7

SAMPLE METHOD: PUMP / GRAB
SAMPLER: D. P. Beatty, H. O. Herrera

FLOW (gpm):	6	6	5.5
DEPTH B.G.L.(ft.):	26	26.15	26.25
LABORATORY	CHEMTECH	CHEMTECH	CHEMTECH
LABORATORY NUMBER	U049928	U052857	U056132
SAMPLE DATE	4/20/90	7/26/90	10/22/90
CYANIDE,CN (WAD)	< 0.002	< 0.002	< 0.002
FLOURIDE, F	0.31	0.24	0.28
GOLD, Au (ttl)	< 0.01	< 0.01	< 0.01
GOLD, Au (diss)	---	< 0.01	< 0.01
HARDNESS, CaCO3	315	694	716
HARDNESS, (Non-Carb.)	39	188	280
HARDNESS, CaCO3 (ttl)	331	685	770
HYDROXIDE, OH	0	0	0
IRON, Fe (ttl)	0.715	0.423	0.228
IRON, Fe (diss)	0.23	0.395	0.21
LEAD, Pb (ttl)	< 0.01	< 0.005	< 0.005
LEAD, Pb (diss)	---	< 0.005	< 0.005
MAGNESIUM, Mg (ttl)	30.4	48.5	52.7
MAGNESIUM, Mg (diss)	---	48.5	50.8
MANGANESE, Mn (ttl)	0.055	0.228	0.105
MANGANESE, Mn (diss)	---	0.228	0.105
MERCURY, Hg (ttl)	< 0.0002	< 0.0002	< 0.0002
MERCURY, Hg (diss)	---	< 0.0002	< 0.0002
NICKEL, Ni (ttl)	0.015	< 0.01	0.015
NICKEL, Ni (diss)	---	< 0.01	0.015
NITRATE, NO3-N	1.28	0.27	0.17
NITRITE, NO2-N	0.029	0.01	< 0.005
PHOSPHATE, PO4-P (ttl)	< 0.01	< 0.01	< 0.01
POTASSIUM, K	0.6	0.7	0.7
SELENIUM, Se (ttl)	< 0.002	< 0.002	< 0.002
SELENIUM, Se (diss)	---	< 0.002	< 0.002
SILICA, SiO2 (diss)	3.6	5.6	5.6
SILVER, Ag (ttl)	< 0.01	< 0.01	< 0.01

BARRICK RESOURCES(USA), INC.
MERCUR MINE

ENVIRONMENTAL / HEALTH

WATER QUALITY ANALYSIS LOG

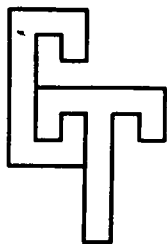
STATE: UTAH
COUNTY: TOOELE
LOCATION: South-East Side Dump Leach #2
SOURCE TYPE: DEEP WELL
SOURCE USE: MONITOR

mg/l(unless noted)

SOURCE NUMBER: MW - 7

SAMPLE METHOD: PUMP / GRAB
SAMPLER: D. P. Beatty, H. O. Herrera

FLOW (gpm):	6	6	5.5						
DEPTH B.G.L.(ft.):	26	26.15	26.25						
LABORATORY	CHEMTECH	CHEMTECH	CHEMTECH						
LABORATORY NUMBER	U049928	U052857	U056132						
SAMPLE DATE	4/20/90	7/26/90	10/22/90						
SILVER, Ag (diss)	---	< 0.01	< 0.01						
SODIUM, Na	94.1	135	149						
SULFATE, SO4	150	281	340						
SUSPENDED SOLIDS	14	< 1.0	< 1.0						
TEMPERATURE, FIELD (C)	---	---	9.7						
THALLIUM, Tl (ttl)	< 0.01	< 0.01	< 0.01						
THALLIUM, Tl (diss)	---	< 0.01	< 0.01						
TOTAL DISS. SOLIDS, FIELD	---	---	1238						
TOTAL DISS. SOLIDS, LAB	570	1065	1230						
TURBIDITY, FIELD (ntu)	---	4.8	1.5						
TURBIDITY, LAB (ntu)	4.6	0.44	1.1						
ZINC, Zn (ttl)	< 0.01	0.02	< 0.01						
ZINC, Zn (diss)	---	0.02	< 0.01						
pH, FIELD (pH units)	---	7.1	6.9						
pH, LAB (pH units)	7.51	7.93	8.43						



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 11-23-90

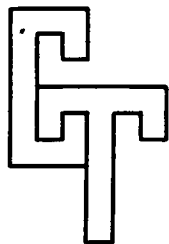
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U056132 - MW-7, Collected 10-22-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Alkalinity as CaCO_3 , mg/l	420
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as $\text{NH}_3\text{-N}$, mg/l	<.1
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	<.01
Barium as Ba (D), mg/l	<.01
Bicarbonate as HCO_3 , mg/l	361
Boron as B (T), mg/l	0.23
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	224
Carbonate as CO_3 , mg/l	74.6
Chloride as Cl, mg/l	229
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,580
Copper as Cu (T), mg/l	0.017
Copper as Cu (D), mg/l	0.012

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CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 11-23-90

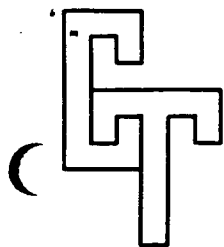
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U056132 - MW-7, Collected 10-22-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Cyanide as CN (T), mg/l	0.0065
WAD Cyanide as CN, mg/l	<.002
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.28
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as CaCO ₃ , mg/l	716
Hardness (Non-Carb) as CaCO ₃ , mg/l	280
Hardness (T) as CaCO ₃ , mg/l	770
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	0.228
Iron as Fe (D), mg/l	0.210
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	52.7
Magnesium as Mg (D), mg/l	50.8
Manganese as Mn (T), mg/l	0.105
Manganese as Mn (D), mg/l	0.105
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	0.015
Nickel as Ni (D), mg/l	0.015


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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 11-23-90

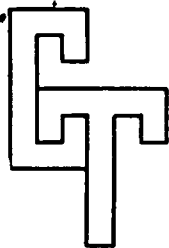
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U056132 - MW-7, Collected 10-22-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Nitrate as $\text{NO}_3\text{-N}$, mg/l	0.17
Nitrite as $\text{NO}_2\text{-N}$, mg/l	<.005
Phosphate as $\text{PO}_4\text{-P}$ (T), mg/l	<.01
Potassium as K, mg/l	0.7
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	5.6
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	149
Sulfate as SO_4 , mg/l	340
Suspended Solids, mg/l	<1
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	1,230
Turbidity, NTU	1.1
Zinc as Zn (T), mg/l	<.01
Zinc as Zn (D), mg/l	<.01
pH Units	8.43
Cations, meq/l	21.89
Anions, meq/l	21.96


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CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 9-26-90

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U052857 - MW-7, 7-26-90

CERTIFICATE OF ANALYSIS

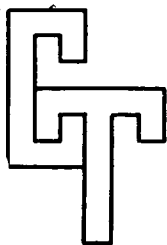
PARAMETER

DETECTED

Alkalinity as CaCO ₃ , mg/l	415
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH ₃ -N, mg/l	<.1
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	<.01
Barium as Ba (D), mg/l	<.01
Bicarbonate as HCO ₃ , mg/l	506
Boron as B (T), mg/l	0.254
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	194
Carbonate as CO ₃ , mg/l	0
Chloride as Cl, mg/l	146
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,766
Copper as Cu (T), mg/l	<.01
Copper as Cu (D), mg/l	<.01

FIELD DATA	
Sample I.D.:	Date:
Temperature (T):	
pH (unf/s):	
Specific Conductance (Umho):	
Transmittance (NTU):	


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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 9-26-90

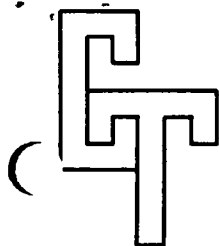
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U052857 - MW-7, 7-26-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Cyanide as CN (T), mg/l	0.0073
WAD Cyanide as CN, mg/l	<.002
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.24
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as CaCO ₃ , mg/l	694
Hardness (Non-Carb) as CaCO ₃ , mg/l	188
Hardness (T) as CaCO ₃ , mg/l	685
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	0.423
Iron as Fe (D), mg/l	0.395
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	48.5
Magnesium as Mg (D), mg/l	48.5
Manganese as Mn (T), mg/l	0.228
Manganese as Mn (D), mg/l	0.228
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01

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CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 9-26-90

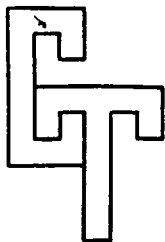
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U052857 - MW-7, 7-26-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Nitrate as NO ₃ -N, mg/l	0.27
Nitrite as NO ₂ -N, mg/l	0.010
Phosphate as PO ₄ -P (T), mg/l	<.01
Potassium as K, mg/l	0.7
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO ₂ (D), mg/l	5.6
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	135
Sulfate as SO ₄ , mg/l	281
Suspended Solids, mg/l	<1
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	1,065
Turbidity, NTU	0.44
Zinc as Zn (T), mg/l	0.020
Zinc as Zn (D), mg/l	0.020
pH Units	7.93
Cations, meq/l	19.6
Anions, meq/l	18.3


Rex Henderson



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 5-15-90

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U049928 - MW-7, 4-20-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Alkalinity as CaCO_3 , mg/l	226
Aluminum as Al (T), mg/l	<.1
Ammonia as $\text{NH}_3\text{-N}$, mg/l	0.76
Arsenic as As (T), mg/l	<.01
Barium as Ba (T), mg/l	<.01
Bicarbonate as HCO_3 , mg/l	276
Boron as B (T), mg/l	0.24
Cadmium as Cd (T), mg/l	<.01
Calcium as Ca, mg/l	82.4
Carbonate as CO_3 , mg/l	0
Chloride as Cl, mg/l	73.4
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Conductivity, uhmos/cm	812
Copper as Cu (T), mg/l	<.01
Cyanide as CN (T), mg/l	0.0027
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.31
Gold as Au, mg/l	<.01
Hardness as CaCO_3 , mg/l	315
Hardness (Non-Carb) as CaCO_3 , mg/l	39
Hardness (T) as CaCO_3 , mg/l	331
Hydroxide as OH, mg/l	0

Rex Henderson

WATER QUALITY ANALYSIS LOG

STATE: UTAH
 COUNTY: TOOELE
 LOCATION: South Side Dump Leach #2
 SOURCE TYPE: DEEP WELL
 SOURCE USE: MONITOR

mg/l (unless noted)

* SOURCE NUMBER: MW - 9

SAMPLE METHOD: PUMP / GRAB
 SAMPLER: D. P. Beatty, H. O. Herrera

FLOW (gpm):	3	3.9	3.9	3.9	---	3.4	3.1			
DEPTH B.G.L. (ft.):	1010	903	903	903	---	915.4	922.83			
	During	During								
	Pump Test	Pump Test								
LABORATORY	CHEMTECH	CHEMTECH	DATA CHEM	FORD	CHEMTECH	CHEMTECH	CHEMTECH			
LABORATORY NUMBER	U048720	U048921	590-0220	90-005421	U049929	U052859	U056133			
SAMPLE DATE	3/7/90	3/15/90	3/15/90	3/15/90	4/20/90	7/26/90	10/24/90			
ANIONS MEQ/l	12.51	10.24			10.3	8.68	8.76			
CATIONS MEQ/l	12.34	10.21			10.58	9.06	9.7			
TOTAL IONS MEQ/l	24.85	20.45	ERR	ERR	20.88	17.74	18.46	ERR	ERR	ERR
ION DIFFERENTIAL %	1.36	0.29	ERR	ERR	2.65	4.19	9.69	ERR	ERR	ERR
ALKALINITY, CaCO3	286	303			233	252	276			
ALUMINUM, Al (ttl)	< 0.1	< 0.1			< 0.1	< 0.1	< 0.1			
ALUMINUM, Al (diss)	< 0.1	< 0.1			---	< 0.1	< 0.1			
AMMONIA, NH3	0.65	0.56			1.05	< 0.1	0.12			
ARSENIC, As (ttl)	0.019	0.018			< 0.01	< 0.01	< 0.01			
ARSENIC, As (diss)	0.015	< 0.01			---	< 0.01	< 0.01			
BARIUM, Ba (ttl)	0.11	0.085			0.012	< 0.01	< 0.01			
BARIUM, Ba (diss)	0.08	0.02			---	< 0.01	< 0.01			
BICARBONATE, HCO3	348	370			284	303	266			
BORON, B (ttl)	0.24	0.087			0.37	0.18	0.17			
CADMIUM, Cd (ttl)	< 0.01	< 0.01			< 0.01	< 0.002	< 0.002			
CADMIUM, Cd (diss)	< 0.01	< 0.01			---	< 0.002	< 0.002			
CALCIUM, Ca	88.4	91.8			86.7	71.9	89.6			
CARBONATE, CO3	0	0			3.5	0	34.9			
CHLORIDE, Cl	105	85.5			55.6	54.4	46			
CHROMIUM, Cr (hex)	< 0.01	< 0.01			< 0.01	< 0.01	< 0.01			
CHROMIUM, Cr (ttl)	< 0.01	0.05			< 0.01	< 0.01	< 0.01			
CHROMIUM, Cr (diss)	< 0.01	< 0.01			---	< 0.01	< 0.01			
CONDUCTIVITY, FIELD umho	1150	---			---	950	832			
CONDUCTIVITY, LAB (umho)	1070	971			799	737	680			
COPPER, Cu (ttl)	0.032	0.027			< 0.01	< 0.01	0.02			
COPPER, Cu (diss)	0.027	0.025			---	< 0.01	0.02			
CYANIDE, CN (ttl)	0.476	0.012	0.03	< 0.01	0.0081	< 0.002	0.0032			
CYANIDE, CN (free)	< 0.01	< 0.01	0.03	< 0.01	< 0.002	< 0.002	< 0.002			

WATER QUALITY ANALYSIS LOG

STATE: UTAH
COUNTY: TOOELE
LOCATION: South Side Dump Leach #2
SOURCE TYPE: DEEP WELL
SOURCE USE: MONITOR

mg/l(unless noted)

SOURCE NUMBER: MW - 9

SAMPLE METHOD: PUMP / GRAB
SAMPLER: D. P. Beatty, H. O. Herrera

FLOW (gpm):	3	3.9	3.9	3.9	---	3.4	3.1			
DEPTH B.G.L.(ft.):	1010	903	903	903	---	915.4	922.83			
	During Pump Test	During Pump Test								
LABORATORY	CHEMTECH	CHEMTECH	DATA-CHEM	FORD	CHEMTECH	CHEMTECH	CHEMTECH			
LABORATORY NUMBER	U048720	U048921	S90-0220	90-005421	U049929	U052859	U056133			
SAMPLE DATE	3/7/90	3/15/90	3/15/90	3/15/90	4/20/90	7/26/90	10/24/90			
CYANIDE, CN (WAD)	0.01	0.012	0.03	< 0.01	< 0.002	< 0.002	< 0.002			
FLOURIDE, F	0.67	0.68			0.64	0.71	0.69			
GOLD, Au (ttl)	< 0.01	< 0.01			< 0.01	< 0.01	< 0.01			
GOLD, Au (diss)	< 0.01	< 0.01			---	< 0.01	< 0.01			
HARDNESS, CaCO3	497	440			475	410	389			
HARDNESS, (Non-Carb.)	109	70			188	91	88			
HARDNESS, CaCO3 (ttl)	547	444			467	410	436			
HYDROXIDE, OH	0	0			0	0	0			
IRON, Fe (ttl)	1.71	1.19			7.1	1.48	1.34			
IRON, Fe (diss)	0.317	0.082			5.37	1.28	1.24			
LEAD, Pb (ttl)	0.015	0.03			< 0.01	< 0.005	< 0.005			
LEAD, Pb (diss)	< 0.01	0.025			---	< 0.005	< 0.005			
MAGNESIUM, Mg (ttl)	79.9	52.1			58.6	53.4	51.2			
MAGNESIUM, Mg (diss)	79.1	52.1			---	53.4	50.8			
MANGANESE, Mn (ttl)	0.065	0.05			0.038	0.043	0.02			
MANGANESE, Mn (diss)	0.057	0.05			---	0.043	0.02			
MERCURY, Hg (ttl)	< 0.0002	< 0.0002			< 0.0002	< 0.0002	< 0.0002			
MERCURY, Hg (diss)	< 0.0002	< 0.0002			---	< 0.0002	< 0.0002			
NICKEL, Ni (ttl)	0.045	0.025			< 0.01	< 0.01	< 0.01			
NICKEL, Ni (diss)	0.045	0.02			---	< 0.01	< 0.01			
NITRATE, NO3-N	0.082	0.14			0.415	0.19	0.14			
NITRITE, NO2-N	---	---			< 0.005	0.012	< 0.005			
PHOSPHATE, PO4-P (ttl)	< 0.01	< 0.01			< 0.01	< 0.01	0.011			
POTASSIUM, K	1.4	1.1			1.4	1	0.9			
SELENIUM, Se (ttl)	0.0024	< 0.002			< 0.002	< 0.002	< 0.002			
SELENIUM, Se (diss)	< 0.002	< 0.002			---	< 0.002	< 0.002			
SILICA, SiO2 (diss)	19.1	22.4			6.2	5.4	5.7			
SILVER, Ag (ttl)	< 0.01	< 0.01			< 0.01	< 0.01	< 0.01			

WATER QUALITY ANALYSIS LOG

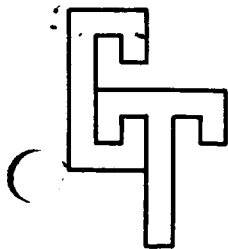
STATE: UTAH
COUNTY: TOOELE
LOCATION: South Side Dump Leach #2
SOURCE TYPE: DEEP WELL
SOURCE USE: MONITOR

mg/l(unless noted)

SOURCE NUMBER: MW - 9

SAMPLE METHOD: PUMP / GRAB
SAMPLER: D. P. Beatty, H. O. Herrera

FLOW (gpm):	3	3.9	3.9	3.9	---	3.4	3.1			
DEPTH B.G.L.(ft.):	1010	903	903	903	---	915.4	922.83			
	During Pump Test	During Pump Test								
LABORATORY	CHEMTECH	CHEMTECH	DATA-CHEM	FORD	CHEMTECH	CHEMTECH	CHEMTECH			
LABORATORY NUMBER	U048720	U048921	S90-0220	90-005421	U049929	U052859	U056133			
SAMPLE DATE	3/7/90	3/15/90	3/15/90	3/15/90	4/20/90	7/26/90	10/24/90			
SILVER, Ag (diss)	< 0.01	< 0.01			---	< 0.01	< 0.01			
SODIUM, Na	30.5	29.4			23.8	22.8	21.7			
SULFATE, SO4	183	83.1			188	103	91			
SUSPENDED SOLIDS	4	4			15	< 1.0	< 1.0			
TEMPERATURE, FIELD (C)	12.2	---			---	---	1.8			
THALLIUM, Tl (ttl)	< 0.01	< 0.01			< 0.01	< 0.01	< 0.01			
THALLIUM, Tl (diss)	< 0.01	< 0.01			---	< 0.01	< 0.01			
TOTAL DISS. SOLIDS, FIELD	---	---			---	---	546			
TOTAL DISS. SOLIDS, LAB	505	646			568	409	493			
TURBIDITY, FIELD (ntu)	---	---			---	11	5.75			
TURBIDITY, LAB (ntu)	6	12			44	8.5	5.5			
ZINC, Zn (ttl)	0.065	0.105			0.045	0.043	< 0.01			
ZINC, Zn (diss)	0.06	0.032			---	0.035	< 0.01			
pH, FIELD (pH units)	7.63	---			---	7.4	7.2			
pH, LAB (pH units)	7.44	7.44			7.43	8.27	8.5			



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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 11-23-90

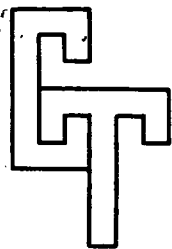
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U056133 - MW-9, Collected 10-24-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Alkalinity as CaCO_3 , mg/l	276
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as $\text{NH}_3\text{-N}$, mg/l	0.12
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	<.01
Barium as Ba (D), mg/l	<.01
Bicarbonate as HCO_3 , mg/l	266
Boron as B (T), mg/l	0.17
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	89.6
Carbonate as CO_3 , mg/l	34.9
Chloride as Cl, mg/l	46
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	680
Copper as Cu (T), mg/l	0.020
Copper as Cu (D), mg/l	0.020

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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 11-23-90

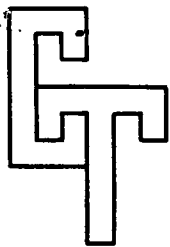
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U056133 - MW-9, Collected 10-24-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Cyanide as CN (T), mg/l	0.0032
WAD Cyanide as CN, mg/l	<.002
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.69
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as CaCO ₃ , mg/l	389
Hardness (Non-Carb) as CaCO ₃ , mg/l	88
Hardness (T) as CaCO ₃ , mg/l	436
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	1.34
Iron as Fe (D), mg/l	1.24
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	51.2
Magnesium as Mg (D), mg/l	50.8
Manganese as Mn (T), mg/l	0.020
Manganese as Mn (D), mg/l	0.020
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01


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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 11-23-90

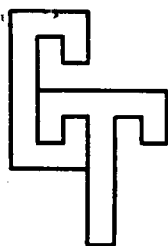
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U056133 - MW-9, Collected 10-24-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Nitrate as $\text{NO}_3\text{-N}$, mg/l	0.14
Nitrite as $\text{NO}_2\text{-N}$, mg/l	<.005
Phosphate as $\text{PO}_4\text{-P}$ (T), mg/l	0.011
Potassium as K, mg/l	0.9
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO_2 (D), mg/l	5.7
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	21.7
Sulfate as SO_4 , mg/l	91
Suspended Solids, mg/l	<1
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	493
Turbidity, NTU	5.5
Zinc as Zn (T), mg/l	<.01
Zinc as Zn (D), mg/l	<.01
pH Units	8.50
Cations, meq/l	9.70
Anions, meq/l	8.76


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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 9-26-90

TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U052859 - MW-9, 7-26-90

CERTIFICATE OF ANALYSIS

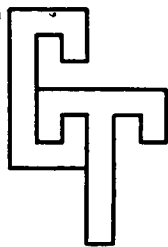
PARAMETER

DETECTED

Alkalinity as CaCO ₃ , mg/l	252
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH ₃ -N, mg/l	<.1
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	<.01
Barium as Ba (D), mg/l	<.01
Bicarbonate as HCO ₃ , mg/l	303
Boron as B (T), mg/l	0.180
Cadmium as Cd (T), mg/l	<.002
Cadmium as Cd (D), mg/l	<.002
Calcium as Ca, mg/l	71.9
Carbonate as CO ₃ , mg/l	0
Chloride as Cl, mg/l	54.4
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	737
Copper as Cu (T), mg/l	<.01
Copper as Cu (D), mg/l	<.01

FIELD DATA	
Sample ID:	Date:
Temperature (°F):	
pH (mV):	
Specific Conductance (Umho):	
Turbidity (NTU):	


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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 9-26-90

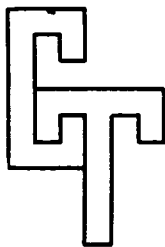
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U052859 - MW-9, 7-26-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Cyanide as CN (T), mg/l	<.002
WAD Cyanide as CN, mg/l	<.002
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.71
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as CaCO ₃ , mg/l	394
Hardness (Non-Carb) as CaCO ₃ , mg/l	91
Hardness (T) as CaCO ₃ , mg/l	410
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	1.48
Iron as Fe (D), mg/l	1.28
Lead as Pb (T), mg/l	<.005
Lead as Pb (D), mg/l	<.005
Magnesium as Mg (T), mg/l	53.4
Magnesium as Mg (D), mg/l	53.4
Manganese as Mn (T), mg/l	0.043
Manganese as Mn (D), mg/l	0.043
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01


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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 9-26-90

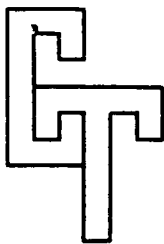
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U052859 - MW-9, 7-26-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Nitrate as NO ₃ -N, mg/l	0.19
Nitrite as NO ₂ -N, mg/l	0.012
Phosphate as PO ₄ -P (T), mg/l	<.01
Potassium as K, mg/l	1.0
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO ₂ (D), mg/l	5.4
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	22.8
Sulfate as SO ₄ , mg/l	103
Suspended Solids, mg/l	<1
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	409
Turbidity, NTU	8.5
Zinc as Zn (T), mg/l	0.043
Zinc as Zn (D), mg/l	0.035
pH Units	8.27
Cations, meq/l	9.06
Anions, meq/l	8.68


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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 5-15-90

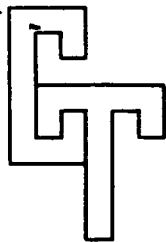
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U049929 - MW-9, 4-20-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Alkalinity as CaCO_3 , mg/l	233
Aluminum as Al (T), mg/l	<.1
Ammonia as $\text{NH}_3\text{-N}$, mg/l	1.05
Arsenic as As (T), mg/l	<.01
Barium as Ba (T), mg/l	0.012
Bicarbonate as HCO_3 , mg/l	284
Boron as B (T), mg/l	0.37
Cadmium as Cd (T), mg/l	<.01
Calcium as Ca, mg/l	86.7
Carbonate as CO_3 , mg/l	3.5
Chloride as Cl, mg/l	55.6
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Conductivity, uhmos/cm	799
Copper as Cu (T), mg/l	<.01
Cyanide as CN (T), mg/l	0.0081
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	0.64
Gold as Au, mg/l	<.01
Hardness as CaCO_3 , mg/l	475
Hardness (Non-Carb) as CaCO_3 , mg/l	188
Hardness (T) as CaCO_3 , mg/l	467
Hydroxide as OH, mg/l	0


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CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 5-15-90

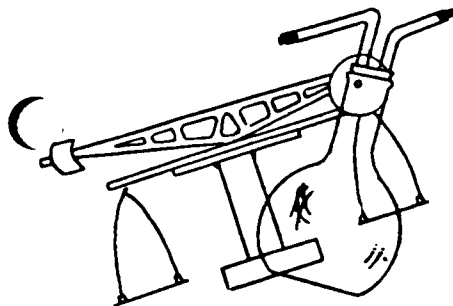
TO: Barrick Mercur Gold Mine
P.O. Box 838
Tooele, UT 84074-4447

SAMPLE ID: Lab #U049929 - MW-9, 4-20-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Iron as Fe (Diss), mg/l	5.37
Iron as Fe (T), mg/l	7.10
Lead as Pb (T), mg/l	<.01
Magnesium as Mg, mg/l	58.6
Manganese as Mn (T), mg/l	0.088
Mercury as Hg, mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nitrate as NO ₃ -N, mg/l	0.415
Nitrite as NO ₂ -N, mg/l	<.005
Phosphate as PO ₄ -P (Ortho), mg/l	<.01
Potassium as K, mg/l	1.4
Selenium as Se (T), mg/l	<.002
Silica as SiO ₂ (Diss), mg/l	6.2
Silver as Ag (T), mg/l	<.01
Sodium as Na, mg/l	23.8
Sulfate as SO ₄ , mg/l	188
Suspended Solids, mg/l	15
Thallium as Tl, mg/l	<.01
Total Dissolved Solids, mg/l	568
Turbidity, NTU	44
Zinc as Zn (T), mg/l	0.045
pH Units	7.43
WAD Cyanide as CN, mg/l	<.002
Cations, meq/l	10.58
Anions, meq/l	10.30


Rex Henderson



Ford Chemical

LABORATORY, INC.

Bacteriological and Chemical Analysis

40 WEST LOUISE AVENUE
SALT LAKE CITY, UTAH 84115

PHONE 466-8761

DATE: 03/22/90

CERTIFICATE OF ANALYSIS

BARRICK MERCUR GOLD
MINES, INC.
P.O. BOX 838
TOOELE, UT 84074


90-005421

SAMPLE: WATER SAMPLES COLLECTED 3-15-90, 1:50 BY DAVID BEATTY
RECEIVED 3-16-90 FOR ANALYSIS STARTING AT 2 P.M. UNDER
PO #10220.

NW-9

MW-B

=====	=====	=====
Cyanide Acid-Dissociable ppm	<.010	<.010
Cyanide Cn tot.ms/l EPA 335.2	<.010	<.010
Cyanide as Cn Free ms/l	<.010	<.010


FORD CHEMICAL LABORATORY, INC.



ENVIRONMENTAL WATER REPORT

Form EPRW-A

Page 1 of 2

Part 1 of 1

Date 3/22/90Agency Identification Number S90-0220 OK 4/6/90Account No. 03018

Barrick-Mercur Mine
P.O. Box 838
Tooele, UT 84074
Attention: David Beatty

Telephone (801) 268-4447

Sampling Collection and Shipment

Sampling Site Monitor well Date of Collection March 15, 1990Date Samples Received at DataChem March 16, 1990

Analytical Results

Parameter Name	Analysis Date	Units	Method	Prep Method	Field Number	Lab Number	MW-9	EJ 1243	MW-B	EJ 1244	Limit of Detection
Dissociable Cyanide	03/21/1990	ug/L	412H [1]				30	ND*			10
Free Cyanide	03/22/1990	ug/L	412F [1]				30	ND*			10
Total Cyanide	03/21/1990	ug/L	9012 [2]				30	ND*			10

† See comment on last page.

ND Parameter not detected.

NR Parameter not requested.

‡ Analyses completed on or before this date.

** Parameter not analyzed (See comment page).

() Parameter between LOD and LOQ.

[] Method Reference (See comments page.)

Analyst: Yong W. HanReviewer: Norman K. ChristensenLaboratory Supervisor: Norman K. Christensen

960 West LeVoy Drive / Salt Lake City, Utah 84123-2500 / (801) 266-7700



ENVIRONMENTAL WATER REPORT

Form EPRW-C

Page 2 of 2

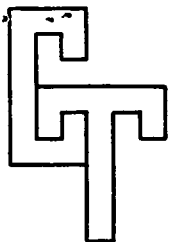
Date 3/23/90

Agency Identification Number S90-0220

Method Index

-- Method Reference --

- [1] "Standard Methods For the Examination of Water and Wastewater"
17th Edition, 1989.
- [2] SW-846 "Test Methods for Evaluating Solid Waste", September 1986.



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 3-21-90

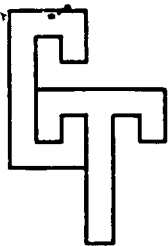
TO: Barrick Mercur Mine
P.O. Box 838
Tooele, UT 84074-0838

SAMPLE ID: Lab #U048921 - MW-9, 3-15-90 @1345

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Alkalinity as CaCO ₃ , mg/l	303
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH ₃ -N, mg/l	0.56
Arsenic as As (T), mg/l	0.018
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	0.085
Barium as Ba (D), mg/l	0.020
Bicarbonate as HCO ₃ , mg/l	370
Boron as B (T), mg/l	0.087
Cadmium as Cd (T), mg/l	<.01
Cadmium as Cd (D), mg/l	<.01
Calcium as Ca, mg/l	91.8
Carbonate as CO ₃ , mg/l	0
Chloride as Cl, mg/l	85.5
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	0.050
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	971
Copper as Cu (T), mg/l	0.027
Copper as Cu (D), mg/l	0.025


Rex Henderson



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 3-21-90

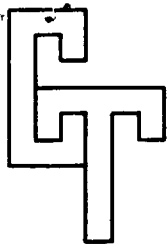
TO: Barrick Mercur Mine
P.O. Box 838
Tooele, UT 84074-0838

SAMPLE ID: Lab #U048921 - MW-9, 3-15-90 @1345

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Cyanide as CN (T), mg/l	0.012
WAD Cyanide as CN, mg/l	0.012
Cyanide as CN (Free), mg/l	<.01
Fluoride as F, mg/l	0.68
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as CaCO ₃ , mg/l	440
Hardness (Non-Carb) as CaCO ₃ , mg/l	70
Hardness (T) as CaCO ₃ , mg/l	444
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	1.19
Iron as Fe (D), mg/l	0.082
Lead as Pb (T), mg/l	0.030
Lead as Pb (D), mg/l	0.025
Magnesium as Mg (T), mg/l	52.1
Magnesium as Mg (D), mg/l	52.1
Manganese as Mn (T), mg/l	0.050
Manganese as Mn (D), mg/l	0.050
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	0.025
Nickel as Ni (D), mg/l	0.020


Rex Henderson



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 3-21-90

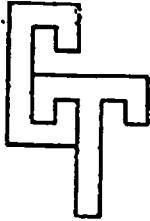
TO: Barrick Mercur Mine
P.O. Box 838
Tooele, UT 84074-0838

SAMPLE ID: Lab #U048921 - MW-9, 3-15-90 @1345

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Nitrate as NO ₃ -N, mg/l	0.14
Phosphate as PO ₄ -P (T), mg/l	<.01
Potassium as K, mg/l	1.1
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO ₂ (D), mg/l	22.4
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	29.4
Sulfate as SO ₄ , mg/l	83.1
Suspended Solids, mg/l	4
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	646
Turbidity, NTU	12
Zinc as Zn (T), mg/l	0.105
Zinc as Zn (D), mg/l	0.032
pH Units	7.44
Cations, meq/l	10.21
Anions, meq/l	10.24


Rex Henderson



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 3-12-90

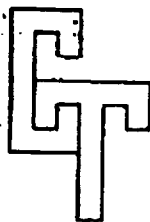
TO: Dames & Moore
250 East 300 South
Salt Lake City, UT 84111

SAMPLE ID: Lab #U048720 - Barrick Mercur MW-9, 3-7-90 @1755
Submitted 3-8-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Alkalinity as CaCO ₃ , mg/l	286
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH ₃ -N, mg/l	0.65
Arsenic as As (T), mg/l	0.019
Arsenic as As (D), mg/l	0.016
Barium as Ba (T), mg/l	0.11
Barium as Ba (D), mg/l	0.080
Bicarbonate as HCO ₃ , mg/l	348
Boron as B (T), mg/l	0.24
Cadmium as Cd (T), mg/l	<.01
Cadmium as Cd (D), mg/l	<.01
Calcium as Ca, mg/l	88.4
Carbonate as CO ₃ , mg/l	0
Chloride as Cl, mg/l	106
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	1,070
Copper as Cu (T), mg/l	0.032
Copper as Cu (D), mg/l	0.027


Rex Henderson



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

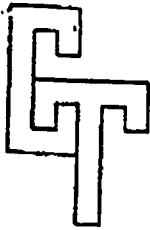
6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 3-12-90

TO: Dames & Moore
250 East 300 South
Salt Lake City, UT 84111SAMPLE ID: Lab #U048720 - Barrick Mercur MW-9, 3-7-90 @1755
Submitted 3-8-90CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Cyanide as CN (T), mg/l	0.476
WAD Cyanide as CN, mg/l	0.010
Cyanide as CN (Free), mg/l	<.01
Fluoride as F, mg/l	0.67
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as CaCO ₃ , mg/l	497
Hardness (Non-Carb) as CaCO ₃ , mg/l	109
Hardness (T) as CaCO ₃ , mg/l	547
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	1.71
Iron as Fe (D), mg/l	0.317
Lead as Pb (T), mg/l	0.015
Lead as Pb (D), mg/l	<.01
Magnesium as Mg (T), mg/l	79.9
Magnesium as Mg (D), mg/l	79.1
Manganese as Mn (T), mg/l	0.085
Manganese as Mn (D), mg/l	0.057
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	0.045
Nickel as Ni (D), mg/l	0.045

Rex Henderson



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 3-12-90

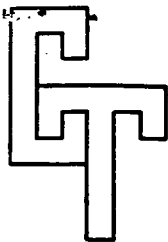
TO: Dames & Moore
250 East 300 South
Salt Lake City, UT 84111

SAMPLE ID: Lab #U048720 - Barrick Mercur MW-9, 3-7-90 @1755
Submitted 3-8-90

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Nitrate as NO ₃ -N, mg/l	0.082
Phosphate as PO ₄ -P (T), mg/l	<.01
Potassium as K, mg/l	1.4
Selenium as Se (T), mg/l	0.0024
Selenium as Se (D), mg/l	<.002
Silica as SiO ₂ (D), mg/l	19.1
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	30.5
Sulfate as SO ₄ , mg/l	183
Suspended Solids, mg/l	4.0
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	505
Turbidity, NTU	6.0
Zinc as Zn (T), mg/l	0.065
Zinc as Zn (D), mg/l	0.060
pH Units	7.44
Cations, meq/l	12.34
Anions, meq/l	12.51


Rex Henderson



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 3-21-90

TO: Barrick Mercur Mine
P.O. Box 838
Tooele, UT 84074-0838

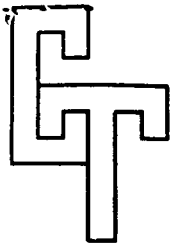
*Distilled Blank
For mw-9*

SAMPLE ID: Lab #U048922 - MW-B, 3-15-90 @1345

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Alkalinity as CaCO ₃ , mg/l	0
Aluminum as Al (T), mg/l	<.1
Aluminum as Al (D), mg/l	<.1
Ammonia as NH ₃ -N, mg/l	0.61
Arsenic as As (T), mg/l	<.01
Arsenic as As (D), mg/l	<.01
Barium as Ba (T), mg/l	<.01
Barium as Ba (D), mg/l	<.01
Bicarbonate as HCO ₃ , mg/l	0
Boron as B (T), mg/l	<.05
Cadmium as Cd (T), mg/l	<.01
Cadmium as Cd (D), mg/l	<.01
Calcium as Ca, mg/l	<.1
Carbonate as CO ₃ , mg/l	0
Chloride as Cl, mg/l	<5
Chromium as Cr (Hex), mg/l	<.01
Chromium as Cr (T), mg/l	<.01
Chromium as Cr (D), mg/l	<.01
Conductivity, uhmos/cm	2.1
Copper as Cu (T), mg/l	0.020
Copper as Cu (D), mg/l	0.020


Rex Henderson



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 3-21-90

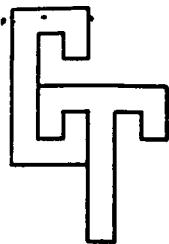
TO: Barrick Mercur Mine
P.O. Box 838
Tooele, UT 84074-0838

SAMPLE ID: Lab #U048922 - MW-B, 3-15-90 @1345

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Nitrate as NO ₃ -N, mg/l	<.01
Phosphate as PO ₄ -P (T), mg/l	<.01
Potassium as K, mg/l	<.1
Selenium as Se (T), mg/l	<.002
Selenium as Se (D), mg/l	<.002
Silica as SiO ₂ (D), mg/l	<1
Silver as Ag (T), mg/l	<.01
Silver as Ag (D), mg/l	<.01
Sodium as Na, mg/l	<.1
Sulfate as SO ₄ , mg/l	<5
Suspended Solids, mg/l	<1
Thallium as Tl (T), mg/l	<.01
Thallium as Tl (D), mg/l	<.01
Total Dissolved Solids, mg/l	<2
Turbidity, NTU	0.15
Zinc as Zn (T), mg/l	0.020
Zinc as Zn (D), mg/l	0.020
pH Units	3.50
Cations, meq/l	<.5
Anions, meq/l	<.5


Rex Henderson



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

DATE: 3-21-90

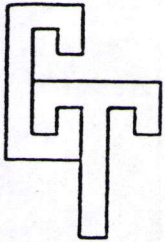
TO: Barrick Mercur Mine
P.O. Box 838
Tooele, UT 84074-0838

SAMPLE ID: Lab #U048922 - MW-B, 3-15-90 @1345

CERTIFICATE OF ANALYSIS

<u>PARAMETER</u>	<u>DETECTED</u>
Cyanide as CN (T), mg/l	<.002
WAD Cyanide as CN, mg/l	<.002
Cyanide as CN (Free), mg/l	<.002
Fluoride as F, mg/l	<.1
Gold as Au (T), mg/l	<.01
Gold as Au (D), mg/l	<.01
Hardness as CaCO ₃ , mg/l	<2
Hardness (Non-Carb) as CaCO ₃ , mg/l	<2
Hardness (T) as CaCO ₃ , mg/l	<2
Hydroxide as OH, mg/l	0
Iron as Fe (T), mg/l	<.01
Iron as Fe (D), mg/l	<.01
Lead as Pb (T), mg/l	<.01
Lead as Pb (D), mg/l	<.01
Magnesium as Mg (T), mg/l	<.1
Magnesium as Mg (D), mg/l	<.1
Manganese as Mn (T), mg/l	<.01
Manganese as Mn (D), mg/l	<.01
Mercury as Hg (T), mg/l	<.0002
Mercury as Hg (D), mg/l	<.0002
Nickel as Ni (T), mg/l	<.01
Nickel as Ni (D), mg/l	<.01


Rex Henderson

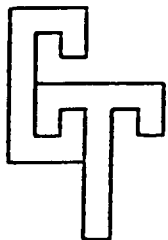


CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

Barrick Mercur				SAMPLERS (Signature)			
Sample Number	Sample Location	Date	Time	Sample Type		Number of Containers	Analysis Required
				Comp.	Grab		
001	TMW-1	4/19/90			X	- 4	
002	TMW-2	4/19/90			X	4	
	WW-7P	4/19/90			X	4	
	MW-5	4/19/90			X	4	
	MW-7	4/19/90			X	4	
	MW-9	4/19/90			X	4	
Relinquished by: (Signature)				Received by: (Signature)		Date/Time	
<i>Heenan Heenan</i>				<i>Docoano Sales</i>		4/20/90 1110	
Relinquished by: (Signature)				Received by: (Signature)		Date/Time	
Relinquished by: (Signature)				Received by: (Signature)		Date/Time	
Shipped by: (Signature)		Date/Time		Received for Laboratory by:		Date/Time	
Method of Shipment:							



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

BARRICK MERCUR GOLD MINE				SAMPLERS (Signature) <i>Heuman Heuman</i>			
Sample Number	Sample Location	Date	Time	Sample Type		Number of Containers	Analysis Required
				Comp.	Grab		
TMW-1	TAILS DAM	7/25	PM		X	5	AS PER DAMS
TMW-2	TAILS DAM	7/25	PM		X	5	AND AS
MW-5	DL # 2	7/25	PM		X	5	FOR DAMS
MW-7	DL # 2	7/25	PM		X	5	PER
MW-8	DL # 2	7/25	PM		X	5	MOORE
MW-9	DL # 2	7/25	PM		X	5	BARRICK
MW-10	DL # 3	7/26	PM		X	5	PARAMETERS
MW-11	DL # 3	7/25	PM		X	5	
					X		
Relinquished by: (Signature) <i>Heuman Heuman</i>				Received by: (Signature) <i>Therese H. Quinn</i>		Date/Time 26 July 11510	
Relinquished by: (Signature)				Received by: (Signature)		Date/Time	
Relinquished by: (Signature)				Received by: (Signature)		Date/Time	
Shipped by: (Signature) <i>Heuman Heuman</i>		Date/Time 7/26/90 1500		Received for Laboratory by:		Date/Time	
Method of Shipment: <i>HAND Carried</i>							

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-5

Personnel: Heiman HeimanDate: 7/25/90Time Water To Surface: 0903 0903Time Pump On: 09:02Pumping Rate: 7.24 gpm Time: 09:05Time Pump Off: 09:30Pumping Rate: 2.2 gpm Time: 09:15Total Pumping Time: 28 minutesPumping Rate: 4.0 gpm Time: 09:20Volume Evacuated: 140 gallonsAverage Pumping Rate: 5.0 gpmDepth To Water: 35.53 ft.

Well Depth: 68.9 ft.

Well Diameter: 5.0 inches

Required Pumping: (68.9)-(Depth To Water) = Water Column
(0.13635)*(Water Column)*(7.48 gal/ft³) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 102.10 gallonsCalculated Total Pumping Time: 20.4 minutesWater Appearance (Turbidity, Color, Odor, etc.) clear, No odorpH Meter: Orion, Model SA-250 Serial No.: _____

pH Calibration Std.: 4.0 Lot No.: _____ Expiration: _____

pH Calibration Std.: 7.0 Lot No.: 8326 Expiration: 11/1/90pH Calibration Std.: 10.0 Lot No.: 9102 Expiration: 4/1/91Specific Conductance Meter: Orion, Model 124 Serial No.: _____SC Calibration Std.: 1990 Lot No.: _____ Expiration: _____

SC Calibration Std.: _____ Lot No.: _____ Expiration: _____

SC Calibration Std.: _____ Lot No.: _____ Expiration: _____

Turbidity Meter: HACH, Model 16800 Serial No.: 1891

Turbidity Calibration Std.: 1.0 ntu Lot No.: 4163 Expiration: N/A

Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A

Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: _____Temperature Meter: Orion, Model SA-250 Serial No.: _____

Field Measurements:

per

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
<u>0903</u>	<u>0</u>	<u>7.5</u>	<u>—</u>	<u>1300</u>	<u>72</u>	<u>—</u>	<u>—</u>
<u>0930</u>	<u>140</u>	<u>6.9</u>	<u>—</u>	<u>1160</u>	<u>4.6</u>	<u>—</u>	<u>—</u>

Calibration Checks:

pH: Standard: 4.0 Reads As: _____ SC: Standard: 1990 Reads As: 2400
Standard: 7.0 Reads As: 6.9 Standard: _____ Reads As: _____
Standard: 10.0 Reads As: 10.0 Standard: _____ Reads As: _____

Turbidity: Standard: 1.0 Reads As: 1.8
Standard: 10.0 Reads As: 12
Standard: 100.0 Reads As: 99

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-7

Personnel: Huma Huma

Date: 7/25/90

Time Pump On: 10:03

Time Water To Surface: 10:04

Time Pump Off: 10:30

Pumping Rate: 6 gpm Time: 10:03

Total Pumping Time: 27 minutes

Pumping Rate: 6 gpm Time: 10:15

Volume Evacuated: 162 gallons

Pumping Rate: 6 gpm Time: 10:30

Depth To Water: 26.15 ft.

Average Pumping Rate: 6 gpm

Well Depth: 69.8 ft.
Well Diameter: 5.0 inches

Required Pumping: (69.8) - (Depth To Water) = Water Column
(0.13635) * (Water Column) * (7.48 gal/ft³) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 133.60 gallons
Calculated Total Pumping Time: 22.27 minutes

Water Appearance (Turbidity, Color, Odor, etc.) clear, sulfur odor

pH Meter: Pen Orion, Model SA-250

Serial No.:

pH Calibration Std.: 4.0

Lot No.:

Expiration:

pH Calibration Std.: 7.0

Lot No.: 8326

Expiration: 11/1/90

pH Calibration Std.: 10.0

Lot No.: 9100

Expiration: 4/1/91

Specific Conductance Meter: H06201 Orion, Model 124

Serial No.:

SC Calibration Std.: 1990

Lot No.:

Expiration:

SC Calibration Std.:

Lot No.:

Expiration:

SC Calibration Std.:

Lot No.:

Expiration:

Turbidity Meter: HACH, Model 16800

Serial No.: 1891

Turbidity Calibration Std.: 1.0 ntu

Lot No.: 4163

Expiration: N/A

Turbidity Calibration Std.: 10 ntu

Lot No.: 4163

Expiration: N/A

Turbidity Calibration Std.: 100 ntu

Lot No.: 4163

Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.:

Temperature Meter: Orion, Model SA-250 Serial No.:

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
<u>10:03</u>	<u>0</u>	<u>7.2</u>	<u>—</u>	<u>1720</u>	<u>4.8</u>	<u>—</u>	<u>—</u>
<u>10:30</u>	<u>162</u>	<u>7.1</u>	<u>—</u>	<u>1800</u>	<u>15</u>	<u>—</u>	<u>—</u>

Calibration Checks:

pH: Standard: 4.0
Standard: 7.0
Standard: 10.0

Reads As: 4.0
Reads As: 6.9
Reads As: 10.0

SC: Standard: 1990
Standard: —
Standard: —

Reads As: 2400
Reads As: —
Reads As: —

Turbidity: Standard: 1.0
Standard: 10.0
Standard: 100.0

Reads As: 1.7
Reads As: 10.2
Reads As: 99

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-9

Personnel: Neuman NeumaDate: 7/25/90Time Pump On: ~~08:00~~ 10:40Time Water To Surface: 10:50Time Pump Off: 15:55Pumping Rate: 3.4 gpm Time: 10:55Pumping Rate: 3.4 gpm Time: 14:05Pumping Rate: 3.4 gpm Time: 15:50Total Pumping Time: 315 minutesPumping Rate: 3.4 gpm Time: 15:50Volume Evacuated: 1071 gallonsAverage Pumping Rate: 3.4 gpmDepth To Water: 915.40 ft.

Well Depth: 1224.40 ft.

Well Diameter: 5.0 inches

Required Pumping: (1224.40) - (Depth To Water) = Water Column
(0.13635) * (Water Column) * (7.48 gal/ft³) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 945.45 gallons
Calculated Total Pumping Time: 279 minutes 4 hrs 40 min

Water Appearance (Turbidity, Color, Odor, etc.) Grey to Brown color
metallic odor

pH Meter: Orion, Model SA-250

Serial No.: pH pen

pH Calibration Std.: 4.0

Lot No.: 8326Expiration: 11/1/90

pH Calibration Std.: 7.0

Lot No.: 9100Expiration: 4/1/91

pH Calibration Std.: 10.0

Lot No.: 9100Expiration: 4/1/91Specific Conductance Meter: Horizon

Orion, Model 124

Serial No.: 1891SC Calibration Std.: 1990Lot No.: 1990Expiration: 1/1/91SC Calibration Std.: 1990Lot No.: 1990Expiration: 1/1/91SC Calibration Std.: 1990Lot No.: 1990Expiration: 1/1/91

Turbidity Meter: HACH, Model 16800

Serial No.: 1891

Turbidity Calibration Std.: 1.0 ntu

Lot No.: 4163

Expiration: N/A

Turbidity Calibration Std.: 10 ntu

Lot No.: 4163

Expiration: N/A

Turbidity Calibration Std.: 100 ntu

Lot No.: 4163

Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 1891

Temperature Meter: Orion, Model SA-250

Serial No.: 1891

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
10:55	<u>0</u>	7.0	<u>—</u>	940	34	—	—
16:00	1088	7.4	<u>—</u>	950	11	—	—

Calibration Checks:

pH: Standard: 4.0

Reads As: —SC: Standard: 1990Reads As: 1890

Standard: 7.0

Reads As: 7.0Standard: —Reads As: —

Standard: 10.0

Reads As: 10Standard: —Reads As: —

Turbidity:

Standard: 1.0

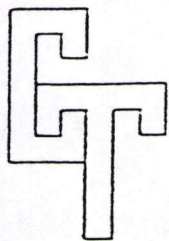
Reads As: —

Standard: 10.0

Reads As: —

Standard: 100.0

Reads As: 100



CHEMTECH

CHEMICAL AND BACTERIOLOGICAL ANALYSES

6100 S. STRATLER
MURRAY, UTAH 84107
(801) 262-7299

Barrick Mercur Gold Mine				SAMPLERS (Signature) x Mike Vodopich			
Sample Number	Sample Location	Date	Time	Sample Type		Number of Containers	Analysis Required
				Comp.	Grab		
MW-5	Dump Leach 2	10-22-90	PM		-	5	Barrick 100 ft For Parameters
MW-7	- - -	10-22	PM		-	5	
MW-9	- - -	10-24	PM		-	5	
WW-7P	Rush Valley	10-24	AM		-	4	Barrick 12 to 20 meters
WW-8P	- - -	10-24	AM		-	4	
WW-8PA	- - -	10-24-90	AM		-	4	
Tailings Reclaim	Tails Pond	10-22-90	PM		-	4	Barrick 12 to 20 meters
Saddle Scepter	Below Saddle Dam	10-22-90	PM		-	4	
Sediment Pond B	Sediment Pond B	10-23-90	AM		-	4	
Relinquished by: (Signature) Mike Vodopich				Received by: (Signature)			Date/Time
Relinquished by: (Signature)				Received by: (Signature)			Date/Time
Relinquished by: (Signature)				Received by: (Signature)			Date/Time
Shipped by: (Signature) Mike Vodopich		Date/Time		Received for Laboratory by: (Signature) Sheri L. Baum		Date/Time 10-24-90 1720	
Method of Shipment: Hand Carried							

PATRICK RESOURCES (USA), INC.
ML FOR MINE

ENVIRONMENTAL DEPARTMENT

MONITOR WELL
WATER LEVEL MEASUREMENT LOG

PROJECT: DUMP LEACH AREA #2				PERSONNEL:		
WELL I.D.	DATE	TIME	REFERENCE POINT	DEPTH TO WATER	WATER ELEVATION	OBSERVATIONS
MW-5	10-22-90	12:45P	Top of Casing North Edge El. 7052.56 ft.	36.72	7052.56 ft. -	
	10-16-90	12:45P		26.05 (ft)	Depth to water 7015.84 7026.51 ft	
MW-7	10/22/90	11:15A	Top of Casing North Edge El. 7046.05 ft.	26.25 (ft)	7046.05 ft. -	
					Depth to water = 7019.80 ft	
4-9	24 10/23/90	9:20 10:28	Top of Casing North Edge El. 7075.04 ft.	922.83	7075.04 ft. -	
				915.86 (ft)	Depth to water = 6159.18 ft 6152.21	
	___/___/___	__:__		____.____ (ft)	Depth to water = ____.____ ft	

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-5

Personnel: VedapichDate: 10 / 22 / 90Time Water To Surface: 12 : 51 PTime Pump On: 12:50 PPumping Rate: 3.4 gpm Time: 12:53 PTime Pump Off: 12:59Pumping Rate: gpm Time: Total Pumping Time: 9 minutesPumping Rate: gpm Time: Volume Evacuated: 30.6 gallonsAverage Pumping Rate: 3.4 gpmDepth To Water: 36.72 ft.

Well Depth: 68.9 ft.

Well Diameter: 5.0 inches

Required Pumping: (68.9)-(Depth To Water) = Water Column
(0.13635)*(Water Column)*(7.48 gal/ft³) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 98.5 gallonsCalculated Total Pumping Time: 29 minutesWater Appearance (Color, Odor, etc.) clear, no odor
well de-watered within 9 minutes.

pH Meter: Orion, Model SA-250

Serial No.: 7598

pH Calibration Std.: 4.0

Lot No.: Expiration: / /

pH Calibration Std.: 7.0

Lot No.: 9086

Expiration: March, 1991

pH Calibration Std.: 10.0

Lot No.: 9100

Expiration: April, 1991

Specific Conductance Meter: Orion, Model 124

Serial No.: 9811093

3C Cal. std.: 100 umho/cm

Lot No. 20496/4066

Expiration: March, 1991

SC Cal. std.: 1000 umho/cm

Lot No. 20514/4067

Expiration: March, 1991

SC Cal. std.: 10000 umho/cm

Lot No. 20399/4068

Expiration: March, 1991

Turbidity Meter: HACH, Model 16800

Serial No.: 1891

Turbidity Calibration Std.: 1 ntu

Lot No.: 4163

Expiration: N/A

Turbidity Calibration Std.: 10 ntu

Lot No.: 4163

Expiration: N/A

Turbidity Calibration Std.: 100 ntu

Lot No.: 4163

Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124

Serial No.: 9811093

TDS Cal. standard: 66 ppm

Lot No. 20496/4066

Expiration: March, 1991

TDS Cal. standard: 660 ppm

Lot No. 20514/4067

Expiration: March, 1991

TDS Cal. standard: 6600 ppm

Lot No. 20399/4068

Expiration: March, 1991

Temperature Meter: Orion, Model SA-250

Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
<u>12:52 P</u>	<u>3.4</u>	<u>7.0</u>	<u>10.7</u>	<u>1039</u>	<u>3.0</u>	<u>683</u>	

Calibration Checks:

pH: Standard: 4.0 Reads As:
Standard: 7.0 Reads As: 7.1
Standard: 10.0 Reads As:

SC: Standard: 100 Reads As:
Standard: 1000 Reads As: 1013
Standard: 10000 Reads As:

Turb.: Standard: 1.0 Reads As:
Standard: 10.0 Reads As:
Standard: 100.0 Reads As: 99

TDS: Std.: 66 Reads As:
Std.: 660 Reads As: 668
Std.: 6600 Reads As:

BARRICK RESOURCES (USA), INC.
MERCUR MINE

ENVIRONMENTAL DEPARTMENT

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-7

Personnel: Vedepick

Date: 10 / 22 / 90

Time Water To Surface: 11 : 31 A

Time Pump On: 11 : 30 A

Pumping Rate: 6.6 gpm Time: 11 : 33 A

Time Pump Off: 12 : 03

Pumping Rate: 5.2 gpm Time: 11 : 43 A

Total Pumping Time: 33 minutes

Pumping Rate: 4.8 gpm Time: 11 : 53 A

Pumping Rate: gpm Time:

Volume Evacuated: 181 gallons

Average Pumping Rate: 5.5 gpm

Depth To Water: 26.25 ft.

Well Depth: 69.8 ft.

Well Diameter: 5.0 inches

Required Pumping: (69.8)-(Depth To Water) = Water Column
(0.13635)*(Water Column)*(7.48 gal/ft³) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 133 gallons

Calculated Total Pumping Time: 24 minutes

Water Appearance (Color, Odor, etc.) LT AMBER & odorless

pH Meter: Orion, Model SA-250

Serial No.: 7598

pH Calibration Std.: 4.0

Lot No.:

Expiration:

pH Calibration Std.: 7.0

Lot No.: 9086

Expiration: March, 1991

pH Calibration Std.: 10.0

Lot No.: 9100

Expiration: April, 1991

Specific Conductance Meter: Orion, Model 124

Serial No.: 9811093

SC Cal. std.: 100 umho/cm

Lot No. 20496/4066

Expiration: March, 1991

SC Cal. std.: 1000 umho/cm

Lot No. 20514/4067

Expiration: March, 1991

SC Cal. std.: 10000 umho/cm

Lot No. 20399/4068

Expiration: March, 1991

Turbidity Meter: HACH, Model 16800

Serial No.: 1891

Turbidity Calibration Std.: 1 ntu

Lot No.: 4163

Expiration: N/A

Turbidity Calibration Std.: 10 ntu

Lot No.: 4163

Expiration: N/A

Turbidity Calibration Std.: 100 ntu

Lot No.: 4163

Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124

Serial No.: 9811093

TDS Cal. standard: 66 ppm

Lot No. 20496/4066

Expiration: March, 1991

TDS Cal. standard: 660 ppm

Lot No. 20514/4067

Expiration: March, 1991

TDS Cal. standard: 6600 ppm

Lot No. 20399/4068

Expiration: March, 1991

Temperature Meter: Orion, Model SA-250

Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
<u>11:31 A</u>	<u>Ø</u>	<u>6.7</u>	<u>12.1</u>	<u>1900</u>	<u>4.5</u>	<u>1252</u>	
<u>12:00 A</u>	<u>165</u>	<u>6.9</u>	<u>29.7</u>	<u>1882</u>	<u>1.5</u>	<u>1238</u>	

Calibration Checks:

pH: Standard: 4.0 Reads As:
Standard: 7.0 Reads As: 7.1
Standard: 10.0 Reads As:

SC: Standard: 100 Reads As:
Standard: 1000 Reads As: 1013
Standard: 10000 Reads As:

Turb.: Standard: 1.0 Reads As:
Standard: 10.0 Reads As:
Standard: 100.0 Reads As: 99

TDS: Std.: 66 Reads As:
Std.: 660 Reads As: 668
Std.: 6600 Reads As:

FIELD LOG
GROUND WATER SAMPLING

Monitor Well I.D.: MW-9

Personnel: BEATTY, VODAPICH

Date: 10 / 24 / 90

Time Water To Surface: 9 : 45 A

Time Pump On: 9 : 30 A

Pumping Rate: 3.1 gpm Time: 9 : 47 A
Pumping Rate: 3.1 gpm Time: 11 : 15 A
Pumping Rate: 3.1 gpm Time: 1 : 10 P
Pumping Rate: 3.1 gpm Time: 2 : 20 P

Time Pump Off: 2 : 33

Total Pumping Time: 303 minutes

Average Pumping Rate: 3.1 gpm

Volume Evacuated: 939 gallons

Depth To Water: 922.83 ft.

Well Depth: 1224.40 ft.
Well Diameter: 5.0 inches

Required Pumping: (1224.40) - (Depth To Water) = Water Column
(0.13635) * (Water Column) * (7.48 gal/ft³) = Gal./1 Casing Volume
1 Casing Volume * 3 = Volume To Be Evacuated (Gallons)

Calculated Volume To Be Evacuated: 923 gallons
Calculated Total Pumping Time: 298 minutes

Water Appearance (Color, Odor, etc.) LT Amber w/ slight Metallic Odor
& LT oil Film

pH Meter: Orion, Model SA-250 Serial No.: 7598
pH Calibration Std.: 4.0 Lot No.: _____ Expiration: 1 / 1
pH Calibration Std.: 7.0 Lot No.: 9086 Expiration: March, 1991
pH Calibration Std.: 10.0 Lot No.: 9100 Expiration: April, 1991

Specific Conductance Meter: Orion, Model 124 Serial No.: 9811093
3C Cal. std.: 100 umho/cm Lot No. 20496/4066 Expiration: March, 1991
SC Cal. std.: 1000 umho/cm Lot No. 20514/4067 Expiration: March, 1991
SC Cal. std.: 10000 umho/cm Lot No. 20399/4068 Expiration: March, 1991

Turbidity Meter: HACH, Model 16800 Serial No.: 1891
Turbidity Calibration Std.: 1 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 10 ntu Lot No.: 4163 Expiration: N/A
Turbidity Calibration Std.: 100 ntu Lot No.: 4163 Expiration: N/A

Total Dissolved Solids Meter: Orion, Model 124 Serial No.: 9811093
TDS Cal. standard: 66 ppm Lot No. 20496/4066 Expiration: March, 1991
TDS Cal. standard: 660 ppm Lot No. 20514/4067 Expiration: March, 1991
TDS Cal. standard: 6600 ppm Lot No. 20399/4068 Expiration: March, 1991

Temperature Meter: Orion, Model SA-250 Serial No.: 7598

Field Measurements:

Time	Vol. Evac	pH	Temp. (C)	Cond.	Turbidity	TDS	Comments
<u>9:45A</u>	<u>0</u>	<u>7.2</u>	<u>10.8</u>	<u>818</u>	<u>18.5</u>	<u>541</u>	
<u>2:25P</u>	<u>915</u>	<u>7.2</u>	<u>1.8</u>	<u>832</u>	<u>5.75</u>	<u>546</u>	

Calibration Checks:

pH: Standard: 4.0 Reads As: _____ SC: Standard: 100 Reads As: _____
Standard: 7.0 Reads As: _____ Standard: 1000 Reads As: 1000
Standard: 10.0 Reads As: 10.2 Standard: 10000 Reads As: _____
Turb.: Standard: 1.0 Reads As: _____ TDS: Std.: 66 Reads As: _____
Standard: 10.0 Reads As: _____ Std.: 660 Reads As: 658
Standard: 100.0 Reads As: 99 Std.: 6600 Reads As: _____